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BRITISH MEDICAL JOURNAL

LONDON SATURDAY JUNE 28 1941

THE REDUCTION OF DUST-BORNE BACTERIA IN THE AIR OF HOSPITAL WARDS BY LIQUID PARAFFIN TREATMENT OF BEDCLOTHES

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Until recently it had been commonly accepted that respiratory infections are spread direct by droplets disseminated from the upper respiratory tract of infected persons or carriers. Large droplets (0.1 to 1 mm.) may be sprayed for a distance of fifteen feet, but, by reason of their size, fall rapidly to the ground. Small droplets (less than 0.1 mm.) evaporate before reaching the floor and may remain floating in the air for long periods as nuclei of small clumps or as single bacteria (Wells and Wells, 1936).

That there is a third possible channel of infection, mainly on dust, is becoming increasingly obvious. It is with this method of spread that we are particularly concerned in this paper. Bloomfield and Felty (1924) demonstrated that there is relatively little or no horizontal expulsion of streptococci from the respiratory tract of infected persons. More recently (1940) Hare has shown that a considerable number of organisms stream diagonally downwards. These may be caught on the bedclothes or fall to the floor, where they dry, and may be re-projected into the air with bed-making or sweeping. Cruickshank (1941) and Thomas (1941a) have shown that large numbers of haemolytic streptococci do accumulate in hospital dust, while Wright, Shone, and Tucker (1941) have demonstrated diphtheria bacilli in the dust of their isolation wards. Until the relative responsibility of each of these methods of spread is finally determined, and especially in the abnormal conditions in which we are living to-day, it is necessary to provide adequate safeguards against all three.

We have previously shown that a very large percentage of aerial contamination from dust can be removed by treating wooden or linoleum-covered floors with spindle oil (van den Ende, Lush, and Edward, 1940; Thomas, 1941b). Van den Ende, Edward, and Lush (1941) showed that both the amount of dust and the numbers of streptococci released from infected bedclothes by beating under experimental conditions were reduced by 90 to 100% by previous treatment with a 30% solution of liquid paraffin in white spirit. This treatment of bedclothes, together with the application of spindle oil to the floor of a ward, has been found by van den Ende and Spooner (1941) to reduce the number of organisms present in the air of the ward throughout the day; the increase in the bacterial content of the ward usually accompanying bed-making and sweeping was reduced to a minimum. The ward in which their experiments were performed was, however, not ideal for the purpose, because of the interchange of dust which occurred between adjacent sections of the ward, and, furthermore, the number of pathogens recovered from the air was small.

This paper describes experiments in both large and single-bed hospital wards, in some of which there were enough haemolytic streptococci in the air to allow them to be used as indicator organisms. Owing to the nature of the infections treated in the wards it was also possible to regulate the experimental conditions much more accurately.

Bacterial Counts

1. *Air.*—The medium employed in all our experiments was 1 in 500,000 gentian-violet blood agar. For air sampling, plates were exposed in slit-machines (Bourdillon, Lidwell, and Thomas). The gentian-violet medium has been shown to be relatively selective for haemolytic streptococci (Garrod, 1933), and reduces the growth of air-borne saprophytes by 95%. Continuous counts were made with the machines adjusted to suck 1 c.ft. of air per minute. In all our diagrams each vertical block represents the count of organisms collected from 10 c ft. of air in ten minutes. Altogether 647 plates were used for these experiments.

2. *Dust.*—Dust samples were collected into sterile bottles and freed from obvious mineral matter, such as pieces of grit and coal. Amounts of 100 mg. were shaken for 15 to 30 seconds in 100 ml. of sterile nutrient broth and then allowed to settle for fifteen minutes. At the end of this period of clarification 2 ml. was transferred to a second bottle containing 18 ml. of broth and again shaken. Varying amounts (0.5 to 0.05 ml.) of this final dilution (0.1 mg. dust per ml.) were plated out into gentian-violet blood agar in duplicate. In a few cases counts of the total organisms were made on serum agar. The counts can, of course, only be regarded as approximate, and probably low, as we have counted as single organisms what may have been clumps of organisms adherent to one another or to dust particles.

3. *Bedclothes.*—Counts were made with a special extractor designed by one of us (M. v. d. E.). This consists of two flanged aluminium plates, fitting closely together with a rubber ring and held by three screw clamps set in U-shaped arms to allow for a fringe of blanket when the apparatus is assembled. In the lower plate is an inlet attached to a 50-ml. syringe by a length of rubber tubing;

in the upper plate is an outlet fitted with a tap and a small glass funnel (Fig. 1). The whole is sterilized by autoclaving.

For use the two halves of the chamber are clamped on to any desired part of the material to be tested, and 50 ml. of nutrient broth is drawn backwards and forwards through the fabric some twenty or thirty times. Finally, a little of the broth is driven upwards into the funnel, the tap is closed, and aliquot parts are plated out into gentian-violet blood agar.

Tests of Efficiency of Blanket-sampling Apparatus

Known volumes of a serum-broth culture of haemolytic streptococci (Group C) were spread over the centre of 6-inch and 1-inch squares of woollen blanket material; at the same time, equal volumes were placed in empty sterile Petri dishes. The 6-inch squares were extracted with 50-c.cm. amounts of broth by means of the special

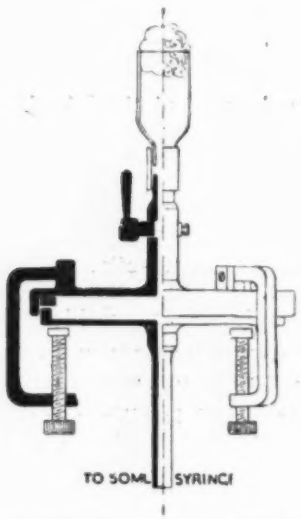

FIG. 1.—Apparatus for making bacterial counts on bedclothes or fabric materials.

apparatus, each 1-inch square was mechanically shaken with 50 c.cm. of broth in a stoppered bottle containing glass beads, and to each Petri dish was added 50 c.cm. of broth. One set of extractions was made immediately, and the second after the infected blanket squares had been dried in high vacuum over P_2O_5. The streptococci in the broth extracts were counted by the technique adopted by Miles

Table showing Experimental Recovery of Streptococci from Blankets

Impregnation	Method of Sampling		Count from Petri Dishes
	With Special Apparatus (Fig. 1)	Mechanically Shaken	
Broth culture dropped on to blanket:			
(a) Sample immediately	59 millions	60 millions	79 millions
(b) Sample after drying over P_2O_5 ..	64 ..	80 ..	64 ..
Exposure to uniform mist of streptococci	5,000	5,250	

and Misra* (1938). A second test was done with circular pieces of the same woollen blanket exposed to a uniformly distributed aerosol of streptococci in a sealed room. One set of these samples, each with a surface area 4.9 sq. in.

* This technique involves the use of glass capillary pipettes which deliver 50 drops of broth per c.cm. (see Wilson, 1922). Our pipettes were specially made for us with parallel-sided capillaries drawn to the required dimensions, and sealed into 6-mm. glass tubing.

(equal to the area extracted by the special apparatus), was extracted by mechanical shaking with broth. The other samples, which were larger, were extracted with the special apparatus. The results, which are given in the accompanying table, show that there was no significant difference between the numbers recovered by the use of the special apparatus and those recovered by thorough shaking with broth. The number of streptococci recovered from hospital blankets should therefore give a fairly accurate indication of the numbers actually present.

Treatment of Bedclothes with Liquid Paraffin

For our preliminary experiments complete sets of bedclothes (1 wool-cotton counterpane, 3 blankets, 2 sheets, 1 draw-sheet, 2 pillow cases, and 1 pair pyjamas per bed) were treated at Hampstead. For our large-scale ward experiments sixteen sets were treated in the hospital laundry. Van den Ende, Edward, and Lush showed that

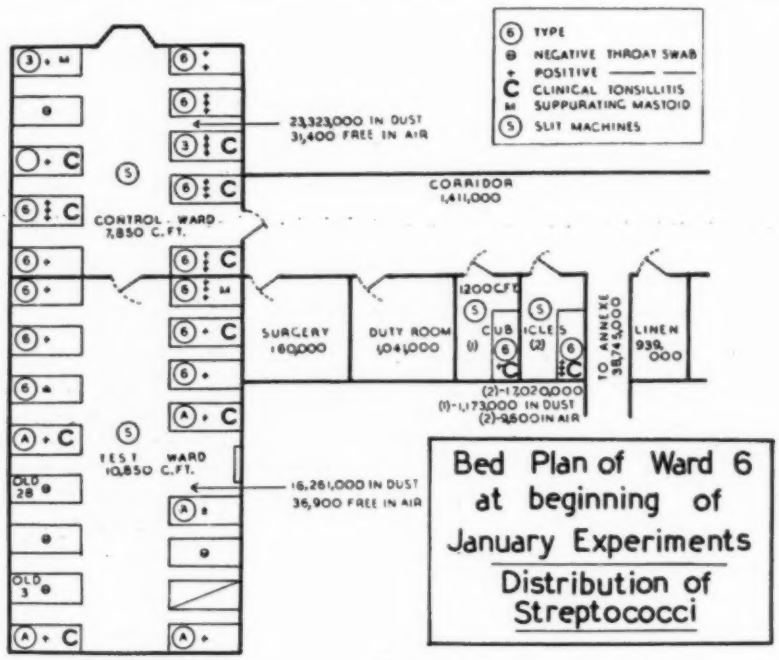

FIG. 2.

the ideal concentration of oil for treating bedding is 30%, and that with this concentration the final bedding is not oily to touch and yet contains an effective proportion of oil (blankets, 3%; bed-linen, 6 to 7%). One difficulty experienced was that the blankets absorbed so much of the parent liquor that only a few could be processed at one time unless larger volumes of oil were available.

Our "oiling party" consisted of Cpl. T. Bury, R.A.M.C., and seven others. Treatment of 160 articles (48 blankets, 48 sheets, 32 pillow-cases, 16 counterpanes, 16 pair pyjamas) fully occupied the party for three hours. Thirty gallons of the 30% solution of liquid paraffin in white spirit was placed in a large tank. The bedclothes were soaked in this solution, partially wrung out by hand, and then transferred to a hydro-extractor. Centrifuging was continued until only a thin trickle of the solution was running from the outflow. The outflow from the hydro-extractor was recovered by blocking the outlet drain and by baling from the trough while the machine was running, and was then returned to the soaking-tanks. From the hydro-extractors the bedding was put through a drying chamber which had previously been heated. In order to minimize fire risk the heat was turned off immediately before placing the bedclothes into the dryer, but the draught fans were kept in operation. Although in this experiment the sheets were not ironed, previous experience has shown that this can be done with

an ordinary single-bed calender. Reduction of the temperature of the steam bed minimizes the loss of oil on the roller pads.

Ward Trials

The ear, nose, and throat wards, in which our experiments were performed, consisted of a main ward divided by a glass partition and door into a 16-bed and a 10-bed section (Fig. 2). Each could be completely isolated. The larger section was used as a test ward and the smaller for control experiments. The floors in both sections were treated with spindle oil. Small single-bed isolation cubicles, each of 1,200 c.ft. capacity, were also used. Consecutive air samples, each of 10 c.ft., were taken with a slit-machine—the first three samples usually during a quiet period, to determine the minimum number of bacteria in the air. During the ten minutes in which the fourth air sample was taken the floors were swept in order to show that no dust could be raised from the oiled floors. During the sixth ten-minute period beds were made. Sampling continued until static conditions again obtained. Simultaneous counts were made in both test and control wards. To overcome the difference in size of the two wards, we made more beds in the test ward than in the control ward on each occasion. Cubicle experiments were carried out as suitable cases presented throughout the whole period.

Distribution of Streptococci in the Wards

It was found that in any ward in which there was at least one patient with a streptococcal infection of the upper respiratory tract the causal organism could be recovered from the ward air, from the floor dust, and from the bedclothes throughout the infective period. During an epidemic of tonsillitis which occurred in January there were at one time nine cases in one ward. The dust obtained from this ward in one sweeping was estimated to contain over 100 million streptococci, and on one occasion nearly 70,000 of these organisms were suspended in the ward air (Fig. 2). The ward blankets that were examined contained between a half and one million streptococci each. Colonies from each test were typed, and the majority were found to correspond to the patients' infecting organism. A few other types were recovered (particularly Types XII and XXV and a Group G Lancefield strain), although no patient or member of the staff had such types in either throat or nose. As many as 30 to 50 streptococci could constantly be recovered on any plate from 10 c.ft. of ward air. We found this count to be regularly increased by bed-making or by any manœuvre which involved disturbing the bedclothes.

Similar counts were obtained in another ward, also with an outbreak of tonsillitis, when automatically exposed plates showed increases of aerial streptococci with the service of a meal, with bed-making, and, in particular, during visiting hours (Fig. 3). Again we recovered organisms of types different from those exhibited by the inhabitants of the wards, and this seems to be most probably accounted for by their persistence upon the bedding. Analysis of bedclothes again yielded up to a million streptococci per blanket.

The increase in aerial streptococci during bed-making was even more strikingly demonstrated in single-bed cubicles, in which there is less dilution owing to their smaller cubic capacity (Fig. 4). The highest count we recorded in a cubicle was 374 streptococci in 2 c.ft. of air. Counts of 150 to 200 have often been observed in these circumstances. Dust counts were higher in these cubicles than in the wards, probably because of a greater difficulty in sweeping them thoroughly and because dilution of infected dust is less than in a ward. The dust of one cubicle, swept up in the morning, contained over 20 million streptococci per gramme, and the dust collected the same evening 5 millions per gramme. It is significant that these dust samples, when retested after a fortnight on the bench, showed very little reduction in the number of viable streptococci present, counts of 13 to 14 millions per gramme still

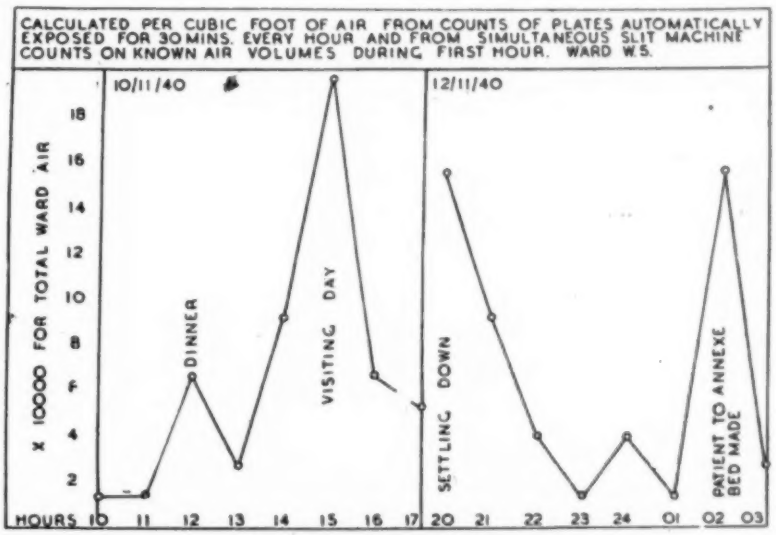
CALCULATED PER CUBIC FOOT OF AIR FROM COUNTS OF PLATES AUTOMATICALLY EXPOSED FOR 30 MINS. EVERY HOUR AND FROM SIMULTANEOUS SLIT MACHINE COUNTS ON KNOWN AIR VOLUMES DURING FIRST HOUR. WARD W.5.
10/11/40
12/11/40
X 10000 FOR TOTAL WARD AIR
DINNER
VISITING DAY
SETTLING DOWN
PATIENT TO ANNEXE BED MADE
HOURS 10 11 12 13 14 15 16 17 20 21 22 23 24 01 02 03

FIG. 3.—Streptococci in ward air

FIG. 4.—Aerial streptococci during bed-making.

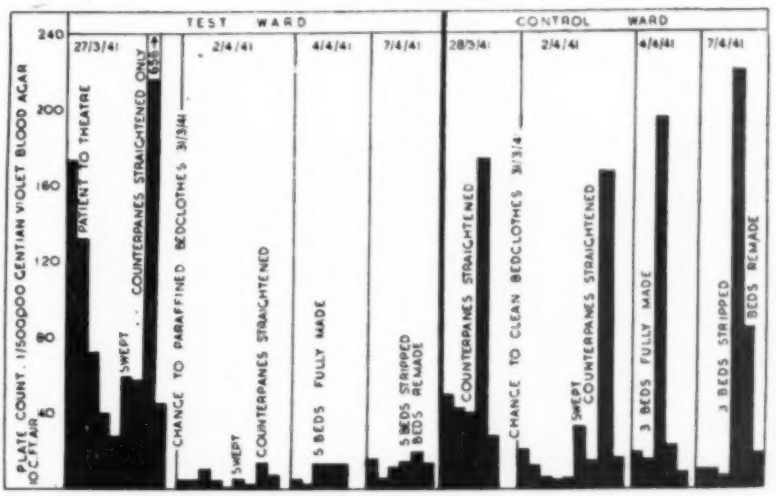

FIG. 5.—Reduction of aerial organisms by treatment of bedclothing.

being obtained. Smaller numbers of streptococci were usually obtained in dust swept up from linoleum floors than in that from wooden floors, probably because the former can be swept more efficiently.

In one cubicle experiment the total number of organisms in 10 c.ft. of air rose from 15 to 1,528 as a result simply of straightening the counterpane and blankets of a single bed. Having regard to the reduction factor of our gentian-violet medium, this is equivalent to a dispersal of 2,500 organisms per cubic foot of air.

Ordinary bedclothes therefore represent such a powerful and persistent reservoir of infection that there is real danger of cross-infection from this source.

Reduction of Dust-borne Organisms in Air by Liquid Paraffin Treatment of Bedclothes

The experiments with paraffined bedclothing fall into three main groups: (a) experiments in which a whole ward was placed in treated bedding and another in clean bedding as a control; (b) experiments in cubicles in which a patient known to be emitting streptococci was transferred to paraffined bedding after a control period in ordinary bedding; and (c) the reverse experiment—changing such a patient into ordinary bedding after a control period in paraffined clothing. Ideally it is desirable to combine (b) and (c) with one patient, but this is rarely practicable: the patients soon cease to produce large numbers of organisms with adequate treatment, and an acute infective period of ten to fourteen days would be necessary for such an experiment.

(a) Ward Experiments

The ward experiments were made during a non-epidemic period, with most of the patients fully convalescent. The numbers of streptococci recovered were therefore small, and for the most part we have relied upon total counts as an index. In a preliminary control period we established that in both test and control wards there was a large increase in the number of organisms in the air with disturbance of bedclothes, even when this entailed only the straightening of counterpanes. At the end of this control period the beds in the test ward were supplied with paraffined bedding, while those in the control ward were given clean but untreated bedclothes. The men in the test ward were not told that their bedding was oiled, and at the time of the change were so used to the air-sampling machines running that they noticed nothing unusual.

Counts were made for periods up to eleven days. Some of the treated bedding was used continuously for more than a month, and when tested in cubicles had lost nothing of its efficiency. The increase in the bacterial content of the air associated with bed-making rapidly reappeared in the control ward, and, as was to be expected, became gradually greater. In the experiments shown diagrammatically in Fig. 5 the mean count during bed-making in the control ward was 194 organisms per plate. During the same period the test ward showed a mean count of less than 15, in spite of the fact that on each occasion five beds were made in the test ward as compared with three in the control ward. The use of paraffined bedclothing therefore reduced the number of organisms liberated during bed-making by 93% even in a large ward of sixteen beds.

(b) and (c) Cubicle Experiments

The results of one of the most striking experiments are shown in Fig. 6. The occupant of the cubicle developed a severe Type VI streptococcal tonsillitis during the January epidemic, and was transferred to clean bedding in a cubicle on the second day of his illness. The floor of the cubicle was not oiled, and the fact that two days after his transfer plates exposed during bed-making and sweeping grew 141 streptococci may partly be due to this. The floor dust collected that morning was estimated to contain over 13 million streptococci per gramme, and a further 4,900,000 per gramme had accumulated by the evening. From

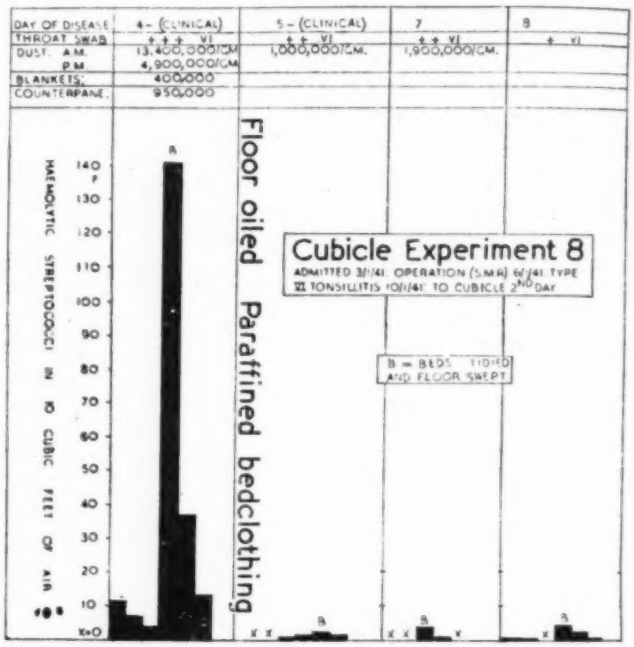

FIG. 6.

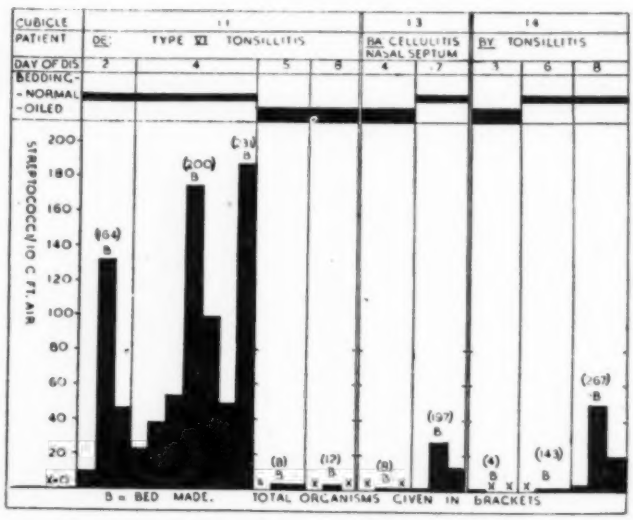

FIG. 7.—Reduction of aerial streptococci by paraffined bedclothing.

samples taken from his bedclothes it was calculated that in this period of forty-eight hours his blankets had collected 400,000 streptococci each, while the counterpane contained nearly a million of these organisms. On that day the floor was oiled and he was changed into paraffined bedclothes. This resulted in a striking fall in the numbers of streptococci projected into the air, the mean count up to the eighth day being less than 4 organisms per plate, in spite of quite vigorous bed-making. That he was emitting streptococci during this period was shown by analyses of floor dust, which contained a million streptococci per gramme on the day after the change and nearly 2 millions per gramme two days later.

A similar, and equally striking, experiment is shown in Fig. 7 (cubicle 11). In this case the floor had been oiled for some months, and at the time of this experiment the

floor treatment was still effective. Control experiments up to the sixth day of the disease showed that 130 to 180 streptococci could be recovered from 10 c.ft. of air during bed-making, and it is significant that two such peaks can be produced within thirty minutes of each other. A change to paraffined bedclothing led to an immediate fall both of total organisms and of haemolytic streptococci by more than 95%. Throughout this period the patient had a luxuriant growth of streptococci in his throat.

The reversed experiments are equally illuminating (Fig. 7, cubicles 13 and 14). Here two men, one with a severe cellulitis of the nasal septum and the other with an acute follicular tonsillitis, were placed direct in paraffined bedclothing for four and three days respectively. This period is sufficient to allow large numbers of streptococci to accumulate on the bedclothes. At the end of this period it was only by hard shaking of the bedclothes that we were able to grow a single streptococcus from the air. These patients were then changed to ordinary bedclothes, which immediately began to liberate considerable numbers of streptococci whenever the beds were made.

The experiments have shown, therefore, that the treatment of bedclothes with a dust-laying oil greatly reduces the number of organisms which can be liberated from them. We think it significant that its use, in the same degree as the use of spindle oil on floors, has never yet failed to reduce the swarms of bacteria, both pathogens and saprophytes, which are showered into the air whenever a bed is made or a blanket moved.

Discussion

That dust may be responsible for cross-infections has been known for many years (Flügge, 1897; Neisser, 1898; Kirstein, 1902), but the importance of these earlier observations seems to have been neglected in succeeding decades. Interest in the infectivity of dust has more recently been revived, and cases have been reported in which cross-infection has undoubtedly been due to dust. The presence of streptococci in ward dust has been shown by Deicher (1927); Allison and Brown (1937); Cruickshank and Godber (1939); Glass (1941). The importance of dust in the spread of respiratory infections in hospital wards has, however, not received general recognition, and little attempt has been made to guard against the danger of dust-borne infection.

Ward dust comes from two main sources—floors and bedclothes—and from these it is distributed into the air by sweeping or by bed-making (Cruickshank, 1941; Miles and others, 1940). Dust on the floor is readily made relatively innocuous by treatment with a dust-laying oil, a fact which has long been known, but has not been adopted by hospitals until recently. The treatment of floors with a dust-laying oil prevents the organisms deposited on them from being distributed into the air. Bacteria are not destroyed by the oil, and the dust swept up must therefore still be treated as infective and disposed of suitably.

Bedclothes constitute an equally if not a more serious source of aerial contamination. Streptococci accumulate upon the bedclothes of any patient with a streptococcal infection of the upper respiratory tract. Deicher could recover streptococci from the walls and furnishings of scarlet fever wards. Glass has obtained similar results in puerperal fever wards, and in the wards in which our experiments were performed it was possible to recover streptococci even from the ceilings. Hare (1941) showed that the accumulation of streptococci could occur also in the environment of healthy streptococcus carriers. The rate at which streptococci accumulate is of importance. With cases of acute follicular tonsillitis placed in clean bedding we have been able to demonstrate an accumulation of nearly a million streptococci in a single blanket in two days.

Although the bedding from such cases is normally disinfected, the same does not hold for every patient who develops a sore throat in hospital. Ward blankets, unless obviously dirty, are only too often used over and over again. The same holds for blankets on theatre trolleys. The risk of spreading infection by this means is only too obvious. Blanket dust is one of the main sources of air-borne streptococci in hospital wards, and may play an important part in air-borne cross-infection. The simple act of making a bed may throw into the air as many as 2,500 organisms per cubic foot, and it is common, in infectious wards, for blankets to contain anything from a half to one million streptococci each. We have shown that on occasion as many as 70,000 streptococci may be freely suspended in still ward air, and that even in a large ward, where considerable dilution must occur, this number is doubled or trebled when a bed is made. In smaller wards the rise is proportionately greater, and a tenfold increase is not uncommon. Cruickshank found 200 streptoccocci deposited upon a pair of Petri dishes in an hour during bed-making and toilet. This would correspond to a recovery of 2,500 streptococci by a slit-machine or 40 per cubic foot of air. These counts are of the same order as we observed in our single-bed cubicle experiment. A patient in such a cubicle may therefore be inhaling between 500 and 1,000 streptococci an hour, of which 90% would have been retained within the respiratory tract (Lehmann, Saito, and Gfrörer, 1911). We do not know what number of organisms constitute an infective dose, but there can be no doubt that in a ward in which no precautions are taken against dust the risk of respiratory infection is very great.

These experiments have shown, further, that during bed-making the number of organisms liberated from bedclothes is reduced by 90 to 95% by treating them with liquid paraffin. This reduction, which occurs both in large wards and in small isolation cubicles, is of the same order as that found by van den Ende, Edward, and Lush in their laboratory experiments. As in the dust of oiled floors, the organisms on oiled blankets, although prevented from being distributed into the air, are still viable and potentially pathogenic.

The application of liquid paraffin from a solution in white spirit requires specially designed hydro-extractors, with an automatic return of the liquor direct to the soaking-tanks, which are not available in hospital laundries. Moreover, the use of white spirit as a solvent involves special fire precautions. In these experiments we were concerned, however, only with establishing the efficacy of the principle involving the application of dust-laying oils on bedclothes. Experiments with simple oil-water emulsions applied in the form of a spray, and with oils other than pure medicinal paraffin, are at present in progress.

Dust-laying methods can, of course, only be expected to be effective against the spread of infection when the patients are confined to bed. They cannot prevent direct infection among ambulant patients, with whom droplet infection probably plays the major part, or in cases in which infection is spread by other means than through the air. It seems essential, therefore, that all hospital patients exhibiting β-haemolytic streptococci in their throats should be confined to bed. If this is done the combination of the method of laying dust on bedclothes with the use of spindle oil on ward floors will greatly assist in reducing the incidence of ward infections. It will probably find special application in scarlet fever, diphtheria, and ear, nose, and throat wards.

Other sources of dust, though probably less important, should not be neglected. Thus damp dusting or dusting with oil-impregnated dusters is essential, and the possibility that streptococci may be carried upon the clothing of doctors, nurses, and ward orderlies must be considered.

These points require further investigation, and it is now necessary to undertake experiments on a large scale, to determine whether a continuance of all available methods of dust-laying will result in a significant reduction of the incidence of cross-infections in hospital wards.

Summary

Attention is drawn to the very large numbers of streptococci which may accumulate in the dust and in the bedclothes of hospital wards.

It is shown that many of these organisms are projected into the air every time a bed is made or in any way disturbed, and it is suggested that these represent a very real danger.

The treatment of bedclothes with liquid paraffin, while not visibly affecting them, causes a 95% reduction in the number of organisms distributed into the air during bed-making.

It is suggested that this method of dust-laying, combined with the use of spindle oil on floors, may assist in reducing the incidence of cross-infections in hospital wards..

We are indebted to Major-Gen. H. Marrian Perry, C.B., O.B.E., F.R.C.P., Director of Pathology, Army Medical Services, for allowing one of us to carry out his part of this work in a military laboratory; to Colonel E. B. Marsh, *M.C.*, R.A.M.C., for placing so many facilities at our disposal; to Dr. C. H. Andrewes, F.R.S., and Dr. R. B. Bourdillon for much helpful advice; to Dr. Otho Fitzgerald, medical superintendent of the hospital, for the use of the hospital laundry; to the medical officers and nursing staff who have co-operated so readily with us; and to our assistants, Sergt. H. G. Stevens, R.A.M.C., and Cpl. T. Bury, R.A.M.C., for their continued help in the laboratory.

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It was recently announced by the Board of Trade that arrangements had been completed for the manufacture of an adequate supply of high-tension batteries to meet the needs of deaf persons who use hearing aids. A standard range of batteries to be manufactured in wartime has been drawn up and embodied in a specification to be issued by the British Standards Institution (B.S. 966) High-tension batteries for hearing aids must be as small in size and as light in weight as possible, and in peacetime these requirements were met by making up the batteries from very small unit cells. At the present time there are heavy demands for these midget cells for batteries for other purposes, and it has become necessary to standardize a range of batteries for hearing aids made up from cells which, so far as can be seen at present, will be available in sufficient quantity to enable hearing aids to continue to be serviced with the minimum of inconvenience to all concerned. There are eleven batteries in the standard range, and these should prove adequate to cover the requirements of all existing makes of hearing aids which employ H.T. batteries, though it may be found that some instruments will need minor modification in order to accommodate them. Such modification applies to the battery casing only, and no modification to the mechanism of any instrument is called for. Copies of this new specification will be available shortly from the British Standards Institution, 28, Victoria Street, S.W.1, price 2s. 3d. post free.

RECENT EXPERIENCES IN THE TREATMENT OF GONORRHOEA IN THE MALE*

BY

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In military practice the incidence of venereal disease is surprisingly low, and in this I have no doubt that we are reaping the benefit not only of the far-sighted policy of the Ministry of Health, but also of the standard of work which medical officers in charge of clinics have maintained during the past twenty years. The Medical Services of the Army also deserve much credit. For many years the officers of the Royal Army Medical Corps have insisted on educating the troops for whose health they are responsible on the dangers of promiscuous intercourse; as is widely known, their preventive work in the venereal field has reached a very high standard. In the active treatment of venereal diseases their standards have been equally high, and the population at large owes a debt to the Army Medical Services which, while unrecognized by the majority—venereal disease not being a subject for public discussion—is nevertheless very real. Despite the disturbances of war the Medical Services have taken steps to ensure that the prevention of venereal diseases and the treatment of these diseases are in keeping with modern standards.

Experiences in the Use of Sulphapyridine

We have found that the local application of sulphapyridine to chancroidal ulcers is a satisfactory form of treatment.

Some of our experiences in the treatment of gonorrhoea with sulphapyridine may be of interest to the profession. At the outset I wish to emphasize that I here refer to practical work. A war is in progress, and it is our duty to get the men fit and back to their units as soon as possible. For this reason the necessarily slow methods of pure clinical research have not been possible; but our work is controlled by a system of surveillance after the patients leave hospital, and we are able to assess from this, with a great degree of accuracy, whether our belief in the methods of treatment we use is based on mere optimism or on therapeutic achievement. The fact that this surveillance is usually carried out by medical officers in districts remote from ours makes this form of control of our work more satisfactory and perhaps less liable to criticism than otherwise it might be. I will refer to this subject later in the paper.

When, a little over a year ago, I took over my duties as officer in charge of a dermatological division, the cases of gonorrhoea were being treated on routine lines. Sulphapyridine was administered thrice daily, the average dosage being 3 grammes a day. Treatment was given for a week or ten days, during which time the men were kept in bed and on a light diet The results were satisfactory, but not outstandingly so.

As you probably know, in the Army cases of gonorrhoea are treated in hospital and the men are not allowed to carry on with their duties. This confinement to hospital may be irksome to the individual, but from the medical standpoint it is of the greatest benefit both to the patient and to the physician. I soon came to the conclusion that with the

* Being part of an address delivered to the North of England Branch of the British Medical Association at Newcastle-upon-Tyne, October 31, 1940.

patients under observation and their diet under control very much larger doses of sulphapyridine could safely be given. I therefore instituted an "eight-day course," during which the men were strictly confined to bed, received only milk diet, and were encouraged to drink as much barley-water as they could stomach. The course of treatment was as follows: On the first day they received 6 grammes of sulphapyridine. This dose was repeated on the second day; on the third and fourth days they were given 4 grammes daily, and on the remaining days 3 grammes. The tablets were given thrice daily, and the course consisted of 32 grammes of sulphapyridine in eight days. Somewhat to my surprise there was no difficulty in keeping the men on milk diet for that length of time. As one philosopher sadly remarked: "Those d——n tablets makes you feel so lousy you doesn't want to eat."

On this course, which was given to several hundred cases, there were no severe complications, but there was too high a proportion of generalized scarlatiniform eruptions associated with a brisk rise of temperature. This complication usually developed between the seventh and the tenth days (usually the ninth) after the course began. It caused the patient some discomfort, but, as the rash and the fever seldom lasted longer than forty-eight hours, it did not give us much anxiety. For the majority of the patients the chief disadvantage of the treatment was that when on the ninth day they had to get up they were weak from the combined effects of the action of the drug and the low diet. Nevertheless the method was successful and relapses were few.

After this routine had been employed for some months I asked Major R. T. Wordingham to concentrate on the treatment of gonorrhoea in my department, and to alter and amend the method as he thought fit. We had the benefit of a consultation with Dr. R. Forgan, who told us that in his opinion it was the initial heavy dose of sulphapyridine which was the essential factor in curing the disease. We kept this opinion in mind, and Wordingham began his investigations.

Requirements in Sulphapyridine Treatment

We agreed that in sulphapyridine treatment there are certain desiderata. These may be tabulated as follows:

1. That the first dose should be the maximum which the average patient would tolerate.

2. That it was a mistake to administer the drug only during the day. The administration should be maintained throughout the whole of the twenty-four hours so as to keep the concentration in the blood as high as possible.

3. That the patients should be kept on milk diet during the course of treatment. We were, and still are, convinced that this is beneficial.

4. That barley-water should always be available in the wards, and that the patients should be encouraged to drink as much of it as possible.

5. That particular care should be taken to avoid constipation. We had noticed that the scarlatiniform eruption due to sulphapyridine was invariably preceded by constipation for forty-eight hours or longer. There is no doubt that failure to defaecate is an important predisposing factor in the development of the complications of sulphapyridine therapy.

Wordingham's first task was to discover the optimum initial dose of the drug and to curtail the length of the course. This necessitated a long series of clinical observations and some biochemical investigations. During these he discovered two things: first, that if the patients are not allowed to smoke, nausea and vomiting—those two bugbears of this form of treatment—are reduced; secondly, that the administration of potassium citrate in large doses (30 grains in a simple mixture, two-hourly) is beneficial. By a process of trial and error Wordingham devised a routine which we have used in many hundreds of cases, and during this time we have had only one death. This case, examined at necropsy by an independent pathologist, was found definitely not to be due to sulphapyridine poisoning. The findings of the pathologist, with notes on the case, were submitted to Lieut.-Colonel T. E. Osmond, R.A.M.C., who agreed that death could not be attributed to the drug.

The course consists in the administration of 22 grammes of sulphapyridine in forty-eight hours. The tablets are crushed and are given in milk every four hours during the day and night. Two important points should be noted—namely, that the tablets are *crushed*, and that there is no interruption of the treatment during the night. The first dose is 5 grammes; the second, 4 grammes; the third, 3 grammes; the fourth, 2 grammes; the remaining eight doses are each of 1 gramme. If a patient begins treatment at noon he will be given 10 crushed tablets (each tablet of sulphapyridine containing 0.5 gramme); at 4 p.m. he receives 8 tablets, and at 8 p.m. 6 tablets. At midnight he is awakened and given 4 tablets, and at 4 a.m. he has 2 tablets. And so the course continues until he has received the total dose of 22 grammes.

The course differs considerably from the routine treatment, devised by Lieut.-Colonel T. E. Osmond, R.A.M.C., which is generally used in the Army. That treatment is as follows: On the first day the patient receives 2 grammes of sulphapyridine as soon as the disease is diagnosed, and thereafter 0.5 gramme every four hours during the day and 2 grammes at bedtime. On the second day he receives a total of 4 grammes of sulphapyridine, and from the third to the seventh day, inclusive, 3 grammes of the drug every day. Irrigation of the urethra with potassium permanganate or oxycyanide of mercury may be used in conjunction with the sulphonamide therapy, at the discretion of the medical officer. This treatment is followed by the usual investigations of the prostate gland, etc.

Lieut.-Colonel Osmond, to whom we are much indebted, gave us the benefit of his opinion both by writing and verbally. Wordingham's intensive course was adopted only after consultation with him and with his concurrence.

During the intensive course of sulphapyridine most of the patients have some degree of frontal headache; about 10% suffer from sickness; and many show a slight degree of cyanosis, but this disappears within twenty-four hours of the termination of the course. The cyanosis is little more than a slight blueness of the lips, and, in some men, a very slight degree of slate-blue discoloration of the face and ears. In this respect Buttle (1939) may be quoted: "Cyanosis seems to be partly due to the elaboration of pigments from condensation of the drug itself, and it is usually thought that it can be neglected from consideration as a symptom of overdose."

Vomiting is a variable factor. If it occurs it usually develops about eighteen hours after starting treatment—that is, about two hours after the taking of the fifth dose. Thereafter the patient may not vomit again, or if he vomits he will do so an hour or two after each administration of the tablets. The wastage by vomiting is therefore not great. At the present time we are having a series of biochemical investigations carried out to determine the average loss of the drug in those patients who vomit. So far as our investigation has gone the actual loss appears to be very small; this confirms the clinical findings, for we have not experienced any marked delay in response to treatment in those cases in which vomiting has occurred. Vomiting is, of course, influenced by psychological factors. If two or three men in a ward vomit, the majority of their companions will follow their example. If before the course begins they are warned that they may be sick, they usually are sick.

Complications of Sulphapyridine Therapy

Headache, lassitude, nausea, and vomiting are the only complications which we anticipate. We have not seen a case of agranulocytosis or of haemolytic anaemia.

There are, however, two complications which are seen and which must be remembered. In a few cases during the course of treatment, and usually early in the second day, the patient may complain of pain in the lumbo-costal area, extending thence to the epigastric region. Usually it is felt on only one side of the body, but it may be bilateral. The pain is severe and the patient may be restless. There is marked tenderness on deep palpation of the upper lumbar area, and there may be tenderness on pressure over the ureter. Occasionally before the pain develops, but as a rule shortly after, the patient's urine becomes blood-stained, and a brisk haematuria may occur. In severe cases there is usually a visible precipitate of crystals if the urine is allowed to stand in a conical urine glass. When these symptoms develop there is a diminution in the amount of urine passed, with nitrogen retention. Vomiting usually occurs, and may be severe. We regard the condition as a pyelonephritis caused by the formation of a compound known as acetyl-sulphapyridine. The crystals of this compound take the form of sharp needles, and we presume that the haematuria is produced in a manner analogous to the bleeding in oxaluria.

In most cases there are no further signs or symptoms, but in a few instances anuria occurs, and may persist for as long as thirty-six to forty hours. During this time no grave symptoms have developed in the cases we have had, but, needless to say, the condition is one which we have viewed with some anxiety.

The treatment given has been simple but successful. The administration of sulphapyridine is stopped; the pain is relieved by 1/3 grain of morphine; barley-water is given in large amounts; and the administration of potassium citrate is continued. If vomiting is troublesome rectal salines are given so that the maximum fluid intake is obtained. Constipation is treated by cascara and, if necessary, by enemata. Here I should like again to emphasize the importance of avoiding constipation during sulphapyridine therapy: in almost all these cases the bowels have not been open for two or three days before the appearance of the symptoms. The pain and haematuria usually disappear within forty-eight to sixty hours of their onset, and as a rule the gonorrhoea is cured. I have not had an opportunity to work out the exact incidence of this complication, but it does not occur in more than 1 in 600 cases.

It may be asked what permanent effects accrue as a result of these events. Needless to say we have watched with particular interest the men who have suffered in this way. In no case have any signs of permanent renal damage been found. Ten days after the haematuria has disappeared the urine has been clear: there has been no albuminuria, and casts and red blood cells have not been demonstrated in centrifugal specimens. Also the blood urea has been normal, and urea-concentration tests have given no evidence of impaired renal function. These tests, repeated after an interval of three or four months, have produced similar satisfactory results.

Recently doubt has been cast on the belief that saline purgatives should not be given during the administration of sulphonamide compounds. Forgan (1939) has said that "it might be proved that there was no advantage, possibly even a disadvantage, in eliminating foods with a high sulphur content from the diet of patients receiving moderate doses of sulphapyridine (M & B 693)." With regard to these two points we have known cases in which, despite instructions to the contrary, some patients have taken magnesium sulphate in fairly large doses whilst receiving sulphapyridine, and others have had eggs and onions while taking sulphanilamide. In no case have we noted any ill effects from these departures from the customary regime.

I have described in some detail Wordingham's course of sulphapyridine therapy because I am convinced that, provided the patient has an average tolerance to the drug, the ideal line is to attack with a maximum dose and to give a short course of treatment. This method succeeds where other methods fail, as in the case (referred to at page 982 of this issue) of the young officer suffering from chronic meningococcal septicaemia, who was not cured by small doses of sulphapyridine, but who rapidly responded to the short intensive course. Quite rightly it may be said that in the Army we are dealing with young men chosen after a medical examination, and we cannot presume that this method of treatment would be so successful if applied to the community at large. We appreciate this, but we have noted that older men in the fourth decade have usually tolerated the course well. Social distinctions sometimes make a difference in therapeutics, and particularly in gonorrhoea, from which the average hospital patient seems often to make better recovery than the private patient; but we have had no complications or difficulties arising in those officers whom we have treated.

There is one obvious precaution on which we do insist: we consider it inadvisable to administer the treatment to patients who have a history suggesting that they may have suffered from gastric or duodenal ulcer, for in these cases there is a risk that severe vomiting may develop and haematemesis may ensue.

The Routine followed by Gonorrhoea Treatment

It must not be imagined that the treatment of gonorrhoea in my department is confined to the administration of sulphapyridine. The full routine is as follows:

As soon as possible after the diagnosis has been confirmed by microscopical examination of the urethral discharge the patient is put to bed. If he is considered to be a suitable subject for intensive therapy he is given a milk diet, and mist. potassii citratis and barley-water as already indicated. He receives 22 grammes of sulphapyridine in forty-eight hours. On the third day he gets up. He is usually a little weak and lethargic, but is quite fit to take his meals in the dining-room and to go to the irrigation room for treatment. Usually his urethral discharge has almost ceased, but there may be a slight muco-purulent urethritis. On microscopical examination of this discharge pus cells and epithelial cells may be found, but gonococci can seldom be demonstrated. He is then kept for two or three days on irrigations of potassium permanganate 1 in 8,000, or oxycyanide of mercury of the same strength. Treatment is given thrice daily and the "grand lavage" is used, the irrigating fluid being allowed to flow into the bladder. On the sixth day the patient, who has not urinated for at least eight hours, reports at 6.30 a.m. for a "morning urethral smear." Very often a smear is not obtainable. If there is any moisture in the meatus it is usually found on microscopical examination to consist of mucoid secretions, probably prostatic in origin, with a few epithelial cells and spermatozoa. Later in the day a two-glass urine test is made, and if this is satisfactory a prostatic smear is taken. Usually no evidence of prostatic infection is found.

If these tests are favourable the patient takes two bottles of stout with his evening meal, for alcohol is a good test of cure. The "morning smear" and the urine examination are repeated on the seventh day, and if these are satisfactory a provocative dose of gonococcal vaccine containing three hundred million gonococci is given. On the eighth day the patient reports for yet another "morning smear"; a prostatic smear is taken and the usual urine test is made. If these tests are all satisfactory the anterior urethra is examined through a urethroscope. At this stage we expect to find a diffuse reddening of the urethra, but no littritis—no inflamed follicles. A curved sound of suit-

able size is passed. If possible we keep the patient under observation for a further two days, as occasionally there is a delayed reaction to the vaccine.

You will note the frequency with which the "morning smear" is investigated, and the fact that every patient has at least two prostatic examinations. This is because we are well aware that one of the dangers of sulphapyridine therapy is that in some cases pus formation, the cardinal sign of gonorrhoea, is decreased, while gonococci may occasionally be present in the urethra or in the prostatic secretion.

When our tests of cure and the period of observation are finished the patient returns to duty, but observation on the case does not end. Three weeks later the man reports to a military hospital, where he is examined by a medical officer who has had a training in the treatment of venereal disease. He is examined for signs of urethral discharge; the two-glass urine test is made, a prostatic smear is taken, and usually a curved sound is passed. The same investigation is repeated during the following two weeks. Although all the tests may be negative (and if they are not he is immediately referred back to us for treatment) he is not yet passed as cured. Three months after his discharge from hospital he is sent either to us or to some other centre. Another provocative injection of gonococcal vaccine is given, and all the usual tests—macroscopic, microscopical, and urethroscopic—are carried out. Only if these are negative is he discharged as cured. During the period of surveillance Wassermann tests are carried out to ensure that a concomitant infection with syphilis has not been missed.

I think, therefore, that we can claim that our work, though purely clinical, is well controlled: this being so, it is satisfactory to find that the relapse rate is under 5%

Summary

The incidence of venereal disease is discussed, together with the part played by the Medical Services of the Army in prevention.

An intensive method of treating gonorrhoea is described at some length.

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ACUTE GONORRHOEA

FURTHER OBSERVATIONS ON TREATMENT BY SULPHAPYRIDINE FOLLOWED BY LAVAGE

BY

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In my original article (Sommerville, 1939) I reviewed 152 consecutive cases of acute gonorrhoea treated with sulphapyridine alone, without adjuvant therapy, in 90% of which early cures without complications were obtained. By comparison Dr. J. G. McGregor-Robertson (1938), using the drug in connection with lavage, claimed 100% early cures, but with 3% complications.

Technique

In a final note to that article I stated that I had altered my technique. This alteration was made in an attempt to maintain the freedom from complications and at the same time to improve the percentage of early cures. The present article is a review of 300 consecutive cases treated according to the new technique, which is as follows.

Sulphapyridine is given, the dosage being 0.5 gramme (one tablet) four times a day for one week. Irrespective of the clinical results at the end of this period, irrigation with 1 in 8,000 potassium permanganate daily is instituted for a week, followed by similar lavage on alternate days for another week. In most cases this completes the treatment, but if the clinical and urinary examinations are not entirely satisfactory at the end of three weeks lavage is persisted with until the desired result is obtained. Thereafter observation for three weeks is maintained, and a prostatic smear is then taken; if this is satisfactory (less than four pus cells per field) urethroscopic examination, followed by the passing of a curved bougie, is carried out a week later. If there is no response to instrumentation a routine Kahn test is done the following week; and finally, all being well, the patient is discharged at the end of nine weeks.

It is now fairly well established that if sulphapyridine is going to act satisfactorily, as it does in 90% of cases, it will do so in approximately three days. If a urethral discharge of any type exists after a week I believe that the virulence of the gonococcus is so diminished that any danger of complication arising as a result of irrigation is at a minimum.

Survey of Results in 300 Cases

The results obtained from the present series serve to prove my contention that large doses of the drug are not necessary, and that practically 100% of early cures can be obtained with almost the same percentage of freedom from complications. This article is published not simply because I think the results are satisfactory but more especially as a plea for economy in the use of the drug and with all due deference to those who believe in and employ massive or intensive dosage.

In going over the case records I find that my original enthusiasm in investigating the time interval required for urethral smears to become gonococcus-negative has waned considerably, and such observations were noted in 103 cases only. The average time interval in these was 1.74 days, compared with 1.92 days in my original series.

For the purpose of "dry" observations 9 cases are excluded from the record of figure averages. Of these 9 patients 7 were irregular attenders and, later, defaulters with no dry observations of any value owing to the time intervals in their attendance, 1 (a chronic persistent alcoholic who defaulted after nineteen days) failed to clear up or even improve, and 1 (one of two cases which showed repeated relapse, and the subject hereafter of a special note) relapsed before a completely dry observation could be obtained. I have divided the remaining 291 into four groups, as shown in Table I.

TABLE I

Type	No. of Cases	Urethra Dry. Day Average
Average case	250	4.98
Avowed alcoholics	33	23.09
Admitted re-exposures	5	25.60
Complications before therapy	3	30.00
Total	291	7.66

This division has been made because there is such a marked discrepancy between the figures of the normal average case and the other three groups. Especially interesting is the alcoholic group. The intake of alcohol quite evidently makes a considerable difference in the prognosis of a case, as the figures prove. It is also scarcely fair to slump all the cases together and thus alter materially the statistics obtained. The results obtained in the present series conform very closely to those of my previous one. Thus from the figures already given it can be seen that out of 293 cases 2 (0.68%) may be recorded as failures.

I have once more investigated the question of intolerance, so as to arrive at a more or less accurate estimate of any toxic upset with the moderate dosage employed. Of the 300 cases 39 (13%) gave some sign of intolerance, 9 of them having two symptoms. Table II shows the incidence of each upset.

TABLE II

Kind of Upset	No.	Average Day Incidence
Nausea	14	2.85
Temperature	1	3 (? influenza)
Headache	14	3.85
Indigestion	5	4
Vomiting	7	4
Cyanosis	2	5
Vertigo	4	6
Rash	1	7

Table III shows the incidence of complications noted before and after starting treatment: 10 (3.33%) were recorded before and 5 (1.66%) after therapy began.

TABLE III.—*Complications*

Type of Complication	Before Treatment	After Treatment	Explanation of Complications Noted After Treatment
Prostatitis	6	2	1: alcohol ++ 1: wife G.C. +
Epididymitis	3	2	1: prostatitis before 1: re-exposed
Prostatitis + epididymitis	1	—	
Periurethral infiltration	—	1	
Total	10	5	

Relapse was noted in 20 (6.66%) of the cases reviewed, no history of re-exposure or fresh infection being admitted. Alcoholism accounted for 15, and this was denied in the remaining 5. Of these 5 patients 2, including the case already mentioned, gave a history of repeated relapse, and constantly denied sexual excitement, re-exposure, or alcoholism. The remaining 3 cases gave no history of alcoholism either before or after the onset of the disease, and are therefore more likely to be examples of genuine failure to respond to the drug. They subsequently cleared up, however, with additional treatment. Of all the cases of relapse 10 subsequently cleared up completely and were discharged well, 9 defaulted, and 1 was transferred to another centre.

I am afraid that I very gravely doubt the veracity of the statements of many patients attending at V.D. centres. I have often been given a denial as regards intake of alcohol, which was later corrected after a lapse of time, when the patient had forgotten what he had told me. *Omnis syphiliticus mendax est* is as true to-day as it ever was, and every dodge and trick must be employed to elicit the truth. The failure of all my wiles to break down repeated denials of alcohol or re-exposure, and the protestations, with every appearance of injured innocence, in two cases of repeated relapse worried me not a little.

These two cases proved so troublesome—and ultimately interesting—that they merit a note by themselves. In both cases, to begin with, alcoholism was admitted at the first examination, but thereafter alcohol, re-exposure, and sexual excitement were consistently denied. No sign of any complication could be found in spite of full and persevering clinical examination for any residual focus. Even before they were ultimately and finally dismissed as cured an appeal to "honour in the cause of science," an appeal which I have often found effective in getting the truth, failed completely, so that I was left with an uneasy and unhappy feeling about the mystery of it all. Both cases had had chemotherapy and lavage, repeated at intervals, and also vaccine therapy. The result was always the same—a quick response to treatment, complete freedom from symptoms for two to three weeks, and then a breakdown to "purulent" again.

While going over the records and preparing my figures I was struck by the comparative regularity of those repeated relapses; so with the aid of a calendar I checked up on the day of the week that each clinical note of "purulent" was made. To my astonishment, and I must admit relief, the incidence of relapse fell on a Monday, except for a few occasions when it fell on a Thursday—that is, forty-eight hours after a Saturday or Tuesday holiday. My own conclusion, although another interpretation may be possible, is that both men had succumbed to temptation and had lied consistently. I presume that the repeated questioning, with the obvious suspicion that I simply did not believe them, and ultimately an increasingly poor prognosis being hinted at, must have scared them sufficiently off alcohol to enable a cure to be finally obtained. Table IV shows the incidence of relapse, the above 2 cases being excluded.

TABLE IV

	No.	Time of Relapse in Days					
		1-7	14	21	28	35	56
Alcohol	15	2	3	2	3	4	1
No apparent cause	3	-	1	1	1	-	-
Total	18	2	4	3	4	4	1

Conclusions

These follow-up investigations confirm the efficacy of sulphapyridine as a cure for gonorrhoea. Moderate dosage—namely, 0.5 gramme four times a day—has continued to give excellent results, and intolerance with this dosage is not pronounced. The use of subsequent irrigation has increased the early cures to practically 100%, with almost the same percentage of absence of complications.

Summary

Review is made of 300 consecutive cases of acute gonorrhoea treated with sulphapyridine, 0.5 gramme four times daily for one week, followed by two weeks' lavage.

Only 2 (0.68%) patients failed to show the usual early clinical cure: one an avowed alcoholic and defaulter; the other, with a subsequent history of repeated relapses, almost certainly an alcoholic.

The course of the disease in alcoholics, in those re-exposed, and in those presenting complications before treatment is contrasted with the average normal case.

Toxic symptoms were noted in 13% of cases, none of them serious.

Complications arising after treatment was begun occurred in 5 (1.66%) cases, but in 4 of them an exciting cause is demonstrable. In only 1 (0.33%) case can the drug be said to have failed to prevent a complication.

Relapse occurred in 20 (6.66%) cases, alcoholism being admitted in 15 and being present almost certainly in 2 others. In 3 (1%) cases relapse occurred for no apparent reason.

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Dr. F. M. Turnbull (*J. Amer. med. Ass.*, 1941, **116**, 1899) treated cases of chronic sinusitis by spraying the nasal passages with a 5% solution of the sodium salt of sulphathiazole. He states that considerable relief was attained in 40 out of 47 patients. He observes that cultures taken from the sinus have shown that the predominating organism is the staphylococcus.

SURGICAL TREATMENT OF CONGENITAL PYLORIC STENOSIS

BY

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The uncertainties of the time in which we live, the possibility that all records may be destroyed, have prompted me to publish the figures and tables reproduced below. They appear to me to be of value in that they demonstrate the striking difference in the mortality of pyloric stenosis in breast-fed and bottle-fed infants. This fact has been recognized, but herewith it is very clearly demonstrated.

Table I is a list of 100 breast-fed babies operated on at the Infants Hospital, Westminster. It is a consecutive list of the breast-fed infants either referred to me by my medical colleagues or admitted under my charge during the period reviewed. No child was ever refused operation, as no child suffering from this disease is ever too ill for operation. There were no deaths. All the children were discharged from hospital well. There were 13 girls and 87 boys. Four children did not have their birth weight recorded. Of the remaining 96, 48 were below birth weight when operated upon.

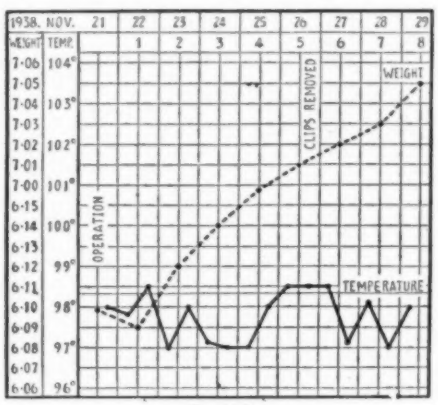

CHART I

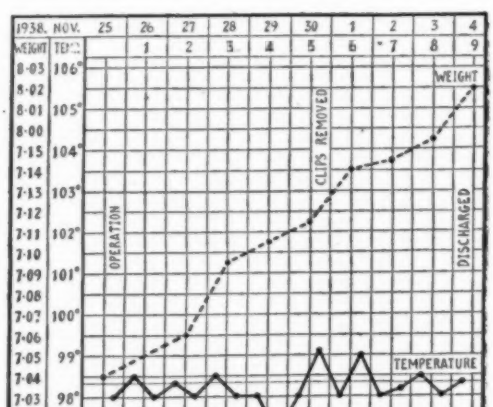

CHART II

Table I shows that the earlier patients were kept in hospital longer than the later ones. The length of stay is a matter of grave import in treating sick babies, but it does not appear to be such a decisive factor in breast-fed children, provided that mother and child are both resident in the hospital. In the earlier part of the list—1 to 50—many of the patients were kept for days before operation. Latterly, the length of stay in hospital has tended to decrease. Most of the patients were admitted under the charge of a physician, and the duration of the period of premedication varied with the practice of the particular physician under whose care the child was placed. Patients admitted direct to my beds have been treated as emergencies, and have been operated on immediately, without any preliminary treatment other than a gastric lavage. One has been agreeably surprised at the good progress these children have made (Charts I, II, and III).

The result in this series of breast-fed infants is 100% cure. Moreover, the cure is speedy, safe, and certain. The outlook seems to be even more helpful than that of most surgical operations, since the anaesthetic risk has been entirely eliminated. The same story, however, does not hold good for the bottle-fed infants. In 1938 23 children were operated on and 2 were lost.

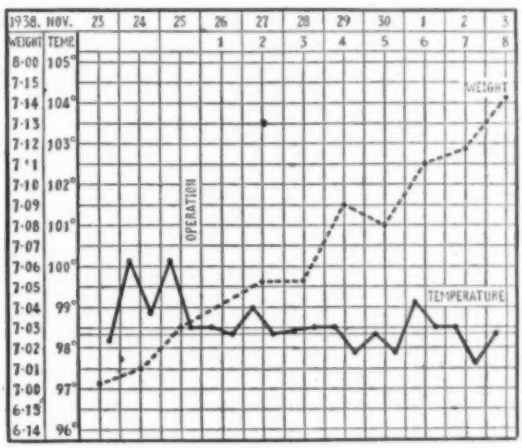

CHART III

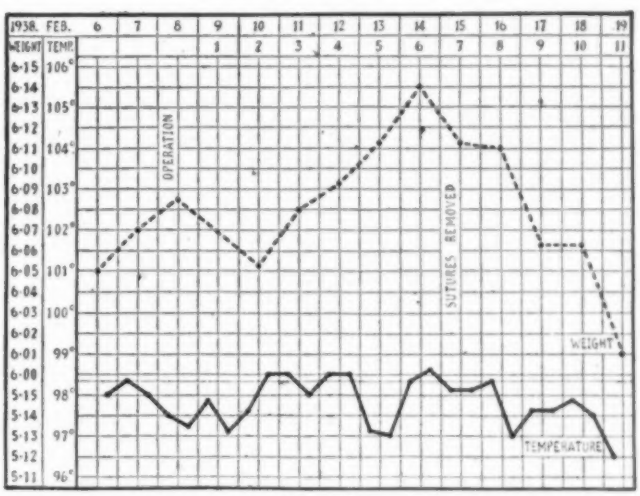

CHART IV

There were certain features in common in the histories of the 5 children who died. The first child "refused the breast from birth," and was artificially fed; the second child was breast-fed for five days only; the third was artificially fed; the fourth was breast-fed for three weeks; and the fifth was not breast-fed at all. The fourth child gives what might be called a "classical history of mismanagement." The child, an only and much-wanted child, was breast-fed until it was three week old. Difficulties were then encountered as the breast milk was said to disagree with it. It was then fed on cow's milk and water. This was followed by a dried milk, and this in turn by another brand of dried milk. Then a condensed milk was used, and finally a further brand of dried milk.

TABLE I.—100 *Consecutive Breast-fed Infants Suffering from Pyloric Stenosis*

No.	Age in Weeks	Sex	Birth Weight	Weight before Operation	Weight on Discharge	No. of Days in Hospital	No. of Days after Operation before Discharge	Gain in Weight
			lb. oz.	lb. oz.	lb. oz.			lb. oz.
1	4	M	9 7½	7 14	9 0	16	12	1 2
2	8½	F	6 0	5 13	6 3	27	15	6
3	6	M	7 4	7 9	8 2	15		9
4	4	F	7 0	6 6	7 1	24	12	11
5	5	M	9 0	8 1	8 12	23	12	11
6	4	F	7 0	5 5	5 6	12	10	1
7	7	M	7 15	7 8	7 8	36	15	
8	10	M	7 13	8 10	8 14	14	9	4
9	8	M	10 0	9 0	9 0	22	10	
10	8	M	8 1	n.k.	10 3	15		
11	4	M	7 3	7 7	n.k.	18		
12	4	M	n.k.	7 0	8 3	14		1 3
13	5	M	7 6	6 10	7 3	18	11	9
14		M	8 3½	7 7½	8 0	9	8	8½
15	4	M	6 12	6 0	6 9	30	18	9
16	4	M	9 8	8 0	8 12	14	10	12
17	8	M	7 0	8 8	8 7	23	8	
18	6	M	8 0	9 2	9 13	12	10	11
19	5	M	7 8	6 3	7 5	18	16	1 2
20	3	F	6 4	5 15	6 11	11	8	12
21	8	F	7 0	8 1	7 15	16	9	
22	3	M	8 8	7 15½	9 5	23	2	1 6
23	6	M	9 6	7 8	7 15	9	6	7
24	6	F	9 2	7 11	8 3	9	7	8
25	4	M	5 4	5 12	6 2	16	11	6
26	2	F	7 8	6 2	6 6	12	10	4
27	3	M	7 0	5 13	6 13	10	10	1 0
28	5	M	6 7	7 5	8 2	14	12	13
29	7	F	8 6	9 7	9 14	16	10	7
30	9	M	6 10	8 15	8 15	12	8	
31	6	M	8 4	7 2	7 9	8	6	7
32	7	M	n.k.	8 3	8 10	6	5	7
33	7	M	9 8	9 0	9 4	7	6	4
34	4	M	6 12	7 5	7 11	11	8	6
35	5	M	7 8	8 4	8 11	5	4	7
36	7	M	8 13	9 0	9 7	13	8	7
37	3	M	6 11	6 4	6 12	8	5	8
38	8	M	9 8	8 14	9 1	9	7	3
39	8	M	6 0	6 3	7 0	14	12	13
40	4	M	5 8	6 4	6 9	10	7	5
41	4	M	8 0	6 13	7 9	10	8	12
42	7	M	7 2	8 12	9 0	10	8	4
43	3	M	7 8	7 5	8 1	13	8	12
44	4	F	n.k.	6 8	7 6	21	19	14
45	4	M	8 6	9 3	9 14	9	8	11
46	6	M	8 5	8 4	8 7	6	4	3
47	3	M	6 4	5 8	6 3	25	10	11
48	6	M	7 0	3 9	6 2	12	9	9
49	3½	M	6 6	5 14	6 13	10	8	15
50	3	M	7 10	6 11	7 4	7	5	9
51	6	M	n.k.	8 9	8 14	9	9	5
52	5	F	6 8	6 6	6 14	15	12	8
53	3	M	10 2	8 3	9 6	18	16	1 3
54	4	M	7 4	6 8	6 15	15	14	7
55	6	M	8 6	6 3	6 15	9	8	12
56	9	M	6 1	7 14	8 1	9	8	3
57	5	M	6 13	8 7	8 13	9	8	6
58	4	M	7 0	8 2	8 7	5	5	5
59	6	F	6 0	7 0	7 2	13	9	2
60	5	M	8 0	9 2	9 13	11	10	11
61	6	M	8 0	8 12	9 2	11	10	6
62	4	M	8 11	8 1	8 8	15	11	7
63	4	M	8 2	6 15	7 2	14	10	3
64	3	M	8 4	7 8	8 5	9	8	13
65	3	M	7 12	6 11	7 11	20	20	1 0
66	3	M	10 9	8 11	9 1	8	7	6
67	2	M	n.k.	6 14	7 1	8	7	3
68	8	M	8 5	7 8	7 12	8	6	4
69	6	M	7 4	7 0	7 4	12	9	4
70	4	M	7 4	5 6	6 10	12	11	1 4
71	4	M	7 4	7 9	7 13	9	7	4
72	4	F	8 0	8 2	8 13	9	8	11
73	7	M	8 4	10 4	10 6	7	6	2
74	5	M	7 15	8 0	8 6	8	6	6
75	4	M	7 8	6 8	6 14	8	7	6
76	4	M	7 8	6 6	6 10	10	8	4
77	3	M	6 0	5 2	5 7	13	11	5
78	4	M	7 7	7 11	8 3	9	8	8
79	4	M	6 0	6 9	6 15	10	7	6
80	8	M	10 0	8 2	8 12	8	7	10
81	5	M	6 5	6 8	7 1	8	7	9
82	4	M	6 11	5 12	6 9	11	11	13
83	3	M	7 12	6 1	6 3	12	9	2
84	4	M	n.k.	5 12	6 4	11	11	8
85	8	M	8 0	7 15	8 9	11	7	10
86	4	F	8 0	6 14	7 6	5	5	8
87	6	M	6 12	5 6	6 0	12	9	10
88	4	M	7 8	7 7	7 11	8	7	4
89	2	M	7 0	6 6	6 14	14	10	8
90	5	M	6 12	7 5	7 11	8	8	6
91	6	M	8 2	8 2	8 15	9	10	13
92	5	M	7 0	6 9	7 2	9	8	9
93	8	M	8 7	9 9	9 11	10	7	3
94	4	M	6 7	6 8	7 4	8	8	11
95	5	M	7 12	7 3	8 1	9	9	14
96	5	M	7 5	7 3	7 14	10	8	11
97	3	M	7 5	6 1	6 5	7	5	4
98	2	M	7 6	6 13	7 12	21	9	5
99	5	M	9 6	7 8	8 5	7	6	13
100	5	M	8 2	7 12	8 0	7	6	4

n.k. = Not known

TABLE II.—*List of Bottle-fed Babies in* 1937

No.	Age in Weeks	Sex	Birth Weight	Weight before Operation	Weight on Discharge	No. of Days in Hospital (total)	No. of Days after Operation before Discharge	Gain in Weight
			lb. oz.	lb. oz.	lb. oz.			lb. oz.
1	6	M	7 0	6 6	6 6	8		
2	10	M	7 8	7 0	Died 10 days after operation			
3	4	M	5 1	5 13	Died 10 days after operation			
4	6	F	n.k.	7 0	7 10	10	9	10 B.-f. first 4 wks. of life
5	8	M	8 12	10 2	10 2	7	4	B.-f. first 5 wks. of life
6	3	F	8 8	5 12	6 4	13	10	8
7	5	M	5 5	5 6	6 5	14	11	15
8	4	F	6 8	5 1	5 0	6	5	15
9	6	M	9 8	7 14	8 3	21	9	5
10	3	M	10 0	8 8	9 9	8	9	1 1
11	8	M	4 2	3 8	4 9	21	20	1 1 A.B.-f. twin
12	3	M	7 12	6 15	7 11	12	9	12 A.B.-f.
13	10	M	8 8	6 14	7 10	12	12	12 A.B.-f.
14	3	M	7 10	6 8	7 4	9	7	12 Twin
15	4	M	7 12	6 11	7 8	20	19	13
16	6	F	7 13	7 1	7 4	19	15	3
17	4	M	6 2	5 8	6 3	16	16	11
18	4	M	7 8	6 12	In hospital 18 days. Died 5 days after operation			
19	6	M	7 2	8 0	8 5	14	5	5
20	8	M	7 4	8 13	8 14	19	13	1
21	8	M	3 8	3 15	5 2	27	26	1 3 7 month prem. twin
22	5	F	8 0	9 6	10 0	13	11	10
23	0	F		5 10	7 1	67	64	1 7

B.-f. = Breast-fed.
A.B.-f. = Given stored breast milk after operation.
n.k. = Not known.

TABLE III.—*List of Bottle-fed Babies in* 1938

No.	Age in Weeks	Sex	Birth Weight	Weight before Operation	Weight on Discharge	No. of Days in Hospital (total)	No. of Days after Operation before Discharge	Gain in Weight
			b. oz.	lb. oz.	lb. oz.			lb. oz.
1	9	F	8 8	8 6	9 4	17	16	14
2	7	M	7 8	7 13	8 8	13	11	11
3	8	M	6 13	6 8	Died 11 days after operation			
4	10	F	4 12	7 3	7 5	10	7	2
5	12	M	10 10	9 15	10 7	9	7	8
6	6	M	6 8	6 12	6 14	11	10	2
7	8	M	7 0	6 11	7 2	7	6	7
8	6	M	7 12	6 7	6 12	15	15	5
9	4	M	7 7	7 5	7 12	13	12	7
10	7	M	7 6	6 9	7 8	8	7	15
11	8	M	8 8	8 1	8 2	12	6	1
12	4	M	8 3	7 14	8 3	8	6	5
13	4	M	6 0	5 9	5 15	11	10	6
14	5	M	8 8	8 4	8 7	8	7	3
15	7	M	8 4	7 0	7 13	12	11	13
16	16	M	6 8	6 6½	Died 8 days after operation			
17	5	M	7 4	8 0	8 4	12	8	4
18	6	M	9 0	7 15	8 5	12	7	6
19	6	M	6 4	6 12	7 2	9	9	6
20	7	M	n.k.	5 4	5 7	8	7	3 Twin
21	3	M	11 0	9 9	11 1	10	10	1 8
22	3	F	5 0	4 7	4 12	10	6	5
23	8	F	5 12	7 4	7 7	6	6	3

The child was eventually brought to the hospital when 8 weeks old, weighing 6 lb. 5 oz. It was operated on after preparation lasting three days. The infant made good progress (Chart IV) and gained weight till the sixth day following operation. It then developed gastro-enteritis and died on the eleventh day. This child should have been examined for a hypertrophic pyloric sphincter when it started to vomit while on breast milk.

A child appears to lose its immunity to gastro-enteritis if once it is taken off the breast. Never take a young infant off the breast, provided the mother is well, till the presence of pyloric stenosis has been definitely excluded. It should be regarded as axiomatic that breast milk never disagrees with an infant. This should be taught to students, nurses, midwives, and welfare and social workers of all kinds.

The advantages of a short period of treatment and early discharge from a hospital ward are unquestioned. Surgery provides this.

The problem of the control of gastro-enteritis among bottle-fed babies admitted to institutions is urgent for both physician and surgeon. Gastro-enteritis is the one danger to be feared in a child with pyloric stenosis whether medically or surgically treated, and its risk is proportional to the duration of hospital treatment. The danger is less with surgical treatment, which requires a stay in hospital of only eight days, than with medical treatment, which takes longer.

Three typical charts, I, II, and III, are the records of three infants operated on consecutively at the Infants Hospital on November 21 and 25, 1938. Two of the children were discharged on the eighth day following operation, one having gained 12 oz. and the other 14 oz. The remaining child was discharged on the ninth day, having gained 14 oz. These charts are reproduced to show the rapidity of the improvement to be expected following successful surgical intervention.

Technique

Prolonged pre-operative preparation is neither necessary nor of great value. The administration of large quantities of saline subcutaneously and intravenously is not advised. The best way to give fluids to an infant is by mouth, and the sooner the child can be placed in a position whereby it can benefit by fluid given by mouth the better. Hence the sooner operation is performed the better. The operation should be preceded by gastric lavage. The lavage is not given in an attempt to cure the chronic gastritis, as it is difficult to believe that lavage can have much effect on gastritis so long as the pylorus is obstructed. Lavage is to empty the stomach of its contents and so prevent decomposing food from entering the intestine, and to empty the stomach of gas. It should be done a quarter of an hour before operation, as a child whose stomach is full of gas is restless under local anaesthesia. Apart from this gastric lavage, no further pre-operative measures are advocated or adopted. No sedative or other form of premedication is necessary or desirable. The child is operated upon in a theatre the temperature of which is as near to 80° F. as possible. If such a theatre is not available the child should be placed on the operating table upon two partially filled rubber hot-water bottles. The temperature of the water in the bottles should be tested with a thermometer, and should be 100° F. Local anaesthesia is invariably used, and is produced by means of 1% ethocaine with or without adrenaline. Never more than 10 c.cm. of this solution is required. These are important factors in eliminating shock. A midline incision is found to be most satisfactory. 3 to 5 c.cm. of ethocaine should be placed subcutaneously along the line of the proposed incision. A little less than this quantity should be divided between the rectus of each side. The remaining 3 to 4 c.cm. should be placed deep to the linea alba—i.e., in the subperitoneal space. The whole procedure can be carried out through two skin punctures. It is very important not to eviscerate the child. Nothing should be allowed to leave the abdomen other than the hypertrophic pyloric tumour. This can be delivered by the use of two pairs of plain dissecting forceps. It is not necessary for the operator to put any part of the hand into the peritoneal cavity. The peritoneum and muscle coat is incised down to the mucosa and the abdomen is closed. The closure is surprisingly easy, as the peritoneum comes together without tension.

In a recently published textbook on surgery for students one finds this statement: "Speed is highly important, and the mortality will depend upon the surgeon's skill." Gentleness is more important than speed. And if the child is under local anaesthesia, and the theatre is warm, speed is of little moment. The essentials of after-treatment consist of guarding the child from the "dangers of gastro-enteritis" and the slow gradual resumption of normal feeding. Appended are feeding charts which have been reproduced from the latest edition of the Infants Hospital *Pharmacopoeia*.

Congenital Pyloric Stenosis Post-operative Feeding

Artificial Feeding: Commence Three and a Half Hours after Operation

Hours after Operation		
3½	1 dr.	7.5% glucose in half-strength normal saline
4	1 dr.	do.
4½	1 dr.	do.
5	1 dr.	do.
5½	1 dr.	do.
6	1 dr.	do.
6½	1 dr.	do.
7	1 dr.	do.
7½	1 dr.	Half-strength ½ Cr. C. & G. Special
8½	2 dr.	do.
9½	3 dr.	do.
12	4 dr.	Full-strength ½ Cr. C. & G. Special formula
13½	6 dr.	do.

Hours after Operation		
15½	1 oz.	Full-strength ½ C. & G. Milk Mixture
17½	1 oz.	do.
19½	1 oz.	do.
21½	1 oz.	do.
23½	1¼ oz.	do.
25½	1½ oz.	do.
28	2 oz.	do.
31	2½ oz.	do.

Then 6 × 3 for 12 hours and thereafter increased according to directions. Water by mouth in small quantities between feeds p.r.n.

Formula (Full Strength)

½ Cr. C. & G. Special	2½ dr.
Dextrimaltose	1 dr.
Water	2½ oz.
Lactic Acid *(B.P.)*	10 drops

Breast Feeding: Commence Three and a Half Hours after Operation

Hours after Operation		
3½	1 dr.	7.5% glucose in half-strength normal saline
4	1 dr.	do.
4½	1 dr.	do.
5	1 dr.	do.
5½	1 dr.	7.5% glucose in half-strength normal saline + ½ dr. breast milk
6½	1 dr.	7.5% glucose in half-strength normal saline + 1 dr. breast milk
7½	1 dr.	do.
9	3 dr.	Breast milk
10½	4 dr.	do.

Hours after Operation		
12	6 dr.	Breast milk
13½	1 oz.	do.
15½	1 oz.	do.
17½	1 oz.	do.
19½	1 oz.	do.
21½	1 oz. 2 dr.	do.
24½	1 oz. 2 dr.	do.
27½	1½ oz.	do.
30½	1½ oz.	do.
33½	1 oz. 6 dr.	do.
36½	1 oz. 6 dr.	do.
39½	2 oz.	do.

Then six or seven feeds three-hourly. Baby put to breast if condition allows two to three days after operation.

Summary

A series of 100 consecutive operations on breast-fed infants for pyloric stenosis is reported without a death.

A similar series of 46 operations on bottle-fed infants resulted in 5 deaths, all from gastro-enteritis.

The practical implications of these results are discussed, and it is pointed out that statistics comparing medical and surgical treatment of pyloric stenosis are worthless unless accompanied by information as to the method of feeding.

I should like to thank the physicians at the Infants Hospital for allowing me to publish the records of the patients admitted under their care.

Stockholm has a scheme for collecting and distributing mother's milk for sick children. At a special centre at the principal milk distributing company nursing mothers who have more milk than their children require are examined free of charge by a physician, including x-ray examination of the lungs, blood tests, etc., and are supplied with sterilized bottles into which the milk is pressed directly from the breast. The milk is paid for at the rate of 4 kronor (4s.) a litre and as little as 1/4 litre or even less a day is accepted. The bottle is left at the nearest of the milk company's shops and taken by the company to the centre, where the contents are examined, pasteurized, and then placed in refrigerators.

OPHTHALMIC CASUALTIES RESULTING FROM AIR RAIDS

BY

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We are now becoming familiar with the types of ocular injury which result from air raids. They usually occur in conjunction with other injuries and are regarded as of secondary importance, particularly during the first few days of treatment. I have had the experience of preparing an ophthalmic hospital which was closed again before any emergency arose, and of starting from "scratch" immediately after a big air raid in a hospital unequipped for ophthalmic work. It has shown me that an ophthalmic hospital as such is impracticable except for protracted cases, and that the ophthalmic surgeon must be prepared to take his instruments and equipment to any centre where his services may be required. He may be met by a total absence of ophthalmic nursing and a lack of appreciation of the importance of vision in a patient who has multiple other injuries. These difficulties can be overcome, but I mention them in the hope that those who are in charge of E.M.S. hospitals will bear them in mind. The provision of ophthalmic drugs, a skeleton set of instruments, and the inclusion on the staff of one or two nurses with ophthalmic training would greatly facilitate matters. If possible some provision should be made for the ophthalmic surgeon to operate elsewhere than in the main theatre, since the latter is likely to be occupied continuously by general surgeons for several days after a raid.

Types of Injury

There appear to be three main causes of ocular injury: (1) explosive incendiary bombs; (2) the sudden compression and expansion of the atmosphere caused by blast; (3) direct blows on the eye.

The resulting injuries present certain features and problems of treatment which are new to the ophthalmic surgeon, and an outline of my observations on approximately 100 cases may therefore provide an interesting comparison for ophthalmic surgeons in other large cities. These notes were made after the raids in October and November, 1940, and have been modified by further experience.

Effects of Incendiary Bombs

In a mild degree the effect of an incendiary bomb was that of multiple foreign bodies—particles of sand and oil were embedded in the eyelids, conjunctivae, and corneae. Whenever possible the foreign bodies were removed from the cornea immediately, flavine oil and atropine was instilled, and when only one eye was affected the patient was able to return home: the eye usually became quiet in one or two weeks.

There were, however, many cases in which the eyes had been burned, and usually both eyes were affected. The lids and conjunctivae swelled, and the corneal epithelium was too oedematous to admit of removal of the foreign bodies for perhaps a week. The patients suffered severe pain and had to be removed to a base hospital, where they made a slow recovery. It was found by experience that metycain and merthiolate ointment gave great relief in the initial stages, without any ill effects on the cornea. Atropine was also adminstered, and, later, saline lotion and collosol argentum drops were employed. It was found better to remove the foreign bodies a few at a time. In one case in which a large number were removed from both corneae a week after injury an alarming infection followed within forty-eight hours; there was a general rise in temperature, and a corneal abscess and hypopyon developed in both eyes. Large doses of sulphapyridine were given, followed by graduated intravenous injections of protein-shock T.A.B. Both eyes were retained; one had 6/12 vision, but in the other there was a perforated cornea.

I was impressed by the softening of all the ocular tissues. In addition to the softening of the cornea I noticed a persistent oedema of the conjunctiva; sutures put into flaps to cover a perforating injury very quickly cut out, and many cases showed lymphatic blebs in the conjunctiva which persisted for weeks after the injury. The sclera, too, appeared to be oedematous, for two cases in which deep burn penetrated to the sclera, developed a spontaneous rupture, and prolapse of the vitreous several days after injury. Secondary infection was rare, but in one case a most intractable attack of superficial punctate keratitis occurred. The resulting vision was usually good, except in the few cases with infection of the cornea, but the eyes remained irritable and injected for many weeks, and there was permanent staining of the conjunctivae.

In addition to the injuries already described, incendiary bombs often caused burns of the eyelids and face which were usually superficial and which were best treated with sterile petroleum jelly. This facilitated the dressing of the eyes and retained the mobility of the lids.

In contrast to these, deep burns of the eyelids occurred in conjunction with extensive burns of the face in firemen and A.R.P. workers directly exposed to fire. The eyes themselves were usually uninjured, and this enabled the gentian violet - silver nitrate treatment to be used in the first instance, followed by petroleum jelly when the lower lids became softened by lacrimation. Contraction was very apt to occur, and necessitated stitching the eyelid margins. After three months two cases were treated successfully with Thiersch grafts.

Effects of Blast

Some peculiar effects on the eye of sudden compression and expansion of the atmosphere were noticed: (a) Proptosis due to a sudden retrobulbar haemorrhage causing immediate total loss of vision: the usual signs of evulsion of the nerve were absent, yet subsequent optic atrophy occurred. (b) Extensive intra-ocular haemorrhage either from an iridodialysis in which the iris vessels were torn through, or from a torn retinal vessel. (c) One or more ruptures of the choroid appearing as crescentic tears near the optic disks: these were quite different from the familiar contusion changes of the retina and were accompanied by small haemorrhages at the macula, with loss of central vision. (d) Acute iritis and acute secondary glaucoma occurred in several cases about a week after injury. These were slow to recover. Investigations were made for any constitutional factor, but they appeared to be due entirely to trauma.

Effects of Direct Blows

Perforating injuries of the cornea and rupture of the sclera from a direct blow were common injuries, and usually the eye had to be removed. Several cases showed a severe traumatic keratitis with multiple folds in Descemet's membrane. Although the cornea cleared well there were always associated contusion changes in the retina, particularly at the macula, giving rise to defective vision. Several cases of penetrating wounds of the orbit occurred in which large particles of wood and glass were buried deep in the tissues; but the sinuses healed up well, as did wounds of the eyelids. There were no cases of intra-ocular foreign bodies requiring the use of the magnet.

Medical Memoranda

Flat-foot in Recruits

To anyone who has been responsible for the medical supervision of recruits it becomes obvious that the condition of flat-foot in all its varying degrees is by far the commonest cause of doubtful efficiency; and it is, I think, experience alone that guides one in the most satisfactory disposal of these cases. I have therefore collected statistics as complete and accurate as possible relating to the incidence, methods of treatment, and progress of all cases of flat-foot in an infantry battalion during its first six months of training.

All degrees of flat-foot have been encountered. The "severe" form, in which the head of the talus has gone right over and the flatness is "complete," causes least trouble. Some men with this condition are placed in a category barring them from an infantry regiment. Of those who are not the majority have no trouble with their feet at all, they can perform long route marches, and suffer only from blisters occurring through pressure on the boot. It is a recognized fact that the severest pain is always caused by the high arched foot beginning to give way, and I have amply proved this in my limited experience.

TREATMENT

I was guided by the *Army Manual of Chiropody*, Mercer's *Orthopaedic Surgery*, and that excellent monograph *Military Orthopaedics*, written by Sir Robert Jones during the last war.

Exercises.—At first I enthusiastically ordered the exercises advocated by the *Army Manual of Chiropody*. To ensure that these were correctly performed I arranged for a class to be held during the times set aside for P.T., and this was supervised by one of my medical orderlies. Sir Robert Jones stated: "If the principle of deviation of body weight on to the outer edge be loyally adhered to every ordinary case will recover, even without special tiptoe exercise." My results, however, were discouraging, and after about six weeks I discontinued this altogether. The crux lies in "loyally adhered to," and it is a crux which I considered impossible to overcome.

Strapping to Support the Ankle.—I did not consider this satisfactory.

Alteration to Boots.—This I found was the only satisfactory method of treatment. I had a rise of one-quarter of an inch or one-third of an inch, according to the severity of the condition, put on the under side of the heel and sole of both boots. At first I met with a barrier of resistance from the cobbler, who, despite most elaborate instructions and diagrams, would insist on putting a rise on the inside under the arch of the foot. This invariably aggravated the symptoms! However, I succeeded in the end in getting what I wanted.

Rest.—In the limited number of more acute cases which occurred a week's rest with no additional treatment was enough.

RESULTS

Altogether 30 men reported sick with symptoms caused by fallen arches. There were 33 other men in the battalion with a marked degree of flat-foot, as evidenced by footprints and appearance—some with extreme splaying and eversion—who never complained. These were all of the first or second degree, in so far as the arch can be restored. Some of them are exceptionally good walkers, and all have been for route marches, reminding one of the story told of the last war, when hundreds of American Indians were said to have walked a thousand miles to enlist at an eastern town. On being examined they were turned down on account of "flat feet." Whereupon they proceeded to walk the thousand miles back again! It is, however, significant that of these 33 cases of "accidentally" discovered flat-foot there were just over twice as many in "HQ" company (drivers, signallers, etc., who had little marching to do) as in any one of the other companies.

Of the 30 men who complained 14 have already been before a medical board or are waiting to do so—these I class as failures; 6 are still under treatment; 4 have left the station, and so are out of touch; and 1 who only had blisters under the sole is recovering. Of the 14 who have been "boarded" 7 did not complain until the sixth month in the Army, when training became very much more severe, and all the 6 who are still being treated did not complain till the sixth month of training. The results of the 30 cases are therefore as follows: 14 failures, 6 successes, 4 lost touch, 6 doubtful. At least 3 of the last group were probable failures. Thus we have 17 probable failures out of 26 followed-up cases.

CONCLUSIONS

The conclusions which I have drawn from these figures are as follows: (1) In cases of flat-foot exercises with the limited facilities afforded by a regiment "in the field" are useless. (2) Any case which fails to respond to treatment within three weeks should be "boarded" without delay. (3) In the examination of recruits very little regard should be paid to the appearance of flat feet, and very much regard to the "foot history" of the patient. This would help to avoid the time wasted by men carrying on until training became severe at the end of six months and then "cracking up." The 14 "failures" had together already wasted six years' training.

I should like to express my thanks to Sergeant Fraser for the great care with which he kept the records of all my patients.

R. T. BURKITT,
Captain, R.A.M.C.

A Case of Prolonged Gestation

The case reported below seems to be worth recording for its medico-legal significance.

CASE RECORD

The patient, a healthy, cheerful, and intelligent woman of about 9 stone, aged nearly 35, did not begin to menstruate until the age of 18. The menstrual cycle has always been a consistent 56 days, regular and painless. By her first husband she had two healthy children—a girl aged 12½ who weighed 9 lb. and had one tooth at birth, and a boy aged 10 who weighed 7½ lb. Both pregnancies were abnormally long—"about an extra month." The first labour was prolonged (four days), and was ended by forceps; the second labour lasted two and a half days, but was otherwise normal.

As the result of a motor crash she was told that it was unlikely she would have more children, and when she married for the second time she took no precautions against becoming pregnant. Her second husband went on war service on March 15, 1940, leaving her with her father and mother, both over 80, on a small-holding on Dartmoor. Her period had ended on March 8. Before the end of March she had symptoms which from her previous experience convinced her she had become pregnant.

By December an active child in normal vertex position occupied an apparently full-time uterus. At nine and a half, and again at ten, months quinine was tried to induce labour, with no other result than "an extra good night's sleep." On February 7 she delivered herself in eight and a half hours of a healthy male child weighing 8½ lb., fully mature and with the fontanelle more closed than usual.

The grandmother was nearly 48 when the patient was born, and all five of her children were carried "over-long," but no exact data can be obtained. March 14 to February 7 is 330 days.

Newton Ferrers. W. F. BENSTED-SMITH, M.B., B.Ch.

The existing arrangements whereby local authorities were authorized at the expense of the Exchequer to provide nursery schools for children under 5 who had been evacuated are to be extended, and Wartime Nurseries for all children under this age, including those of women in employment (whether the latter have been evacuated or are local residents) are to be established in all areas according to local needs. They may be part-time nurseries open approximately during school hours or whole-time nurseries open for periods up to 12 to 15 hours, and medical officers of health are to make arrangements for the regular medical inspection and supervision of the children.

Reviews

PERVADING INTELLIGENCE

Life Magnificent. By Henry Atkinson. (Pp 316. 7s. 6d. net.) London: Watts and Co. 1941.

The human brain was not developed for the purpose of thinking about the illimitable but to enable man to contend with his immediate environment; therefore reason, being dependent on the brain, cannot really grasp abstractions. Nevertheless, his boundless curiosity will always urge man on to a pursuit doomed to inevitable failure, but yielding many rewards by the wayside. This we take it is the purpose of Mr. Henry Atkinson's *Life Magnificent*, in which he emphasizes two principles—an all-pervading intelligence in the universe, and the non-intervention of any power external to that intelligence. This is not quite so remote from Bishop Berkeley as the author seems to think. It is too often forgotten that the bishop did not claim that material things only existed in our thought, but, with Plato, that they also existed in the mind of deity. True he differs from them when he says that "intelligence is within the universe, within existing things, within all development, not outside it, and that in consequence everything consists of Intelligence itself." But when he goes on to say, "Intelligence has developed in the same manner as that of man and all organic forms; it is not an autocratic dictator . . . it knows no more of what man may become than man himself does; it endeavours to tune existence to finer harmonies," he is really in agreement with the philosophy of Prof. S. A. Alexander, though starting from different premises. The author was led to his conclusions from watching the healing of a simple wound, a profoundly impressive spectacle to any thinking mind, which convinced him that here was an obviously intelligent sequence. He argues back to the postulate of a primitive unit which he labels the mitron and maintains that, if we reject the development of the universe from the movements of such a primitive particle by means of its own intelligence, we must accept the separate creation of all sorts of energy and matter which have adjusted themselves to one another by a truly marvellous series of miracles. The physicist suggests that his waves which result in definite impressions on our senses have no material existence; Mr. Atkinson suggests that "if one can swallow that camel, there need be no straining at the gnat of Intelligence."

This thesis is skilfully maintained by abundance of scientific illustrations ranging from spiral nebulae to sociology. It is a pity therefore that the index should be wholly inadequate to a book of this importance. For the author is anxious to turn his theories to practical use in the conduct of life by showing how the evils of the artificial conditions of man's present physical and mental life lead frequently to disaster, and how his future welfare depends on the perfect association between his individual intelligence and that of his environment. By way of illustration he asserts that perhaps the greatest tragedy of mankind was the disappearance of Cro-Magnon man some 20,000 years ago, for he regards this as a higher type than the one from which the existing races developed. It is indeed a recurrent tragedy that the more civilized races tend to be destroyed by the more brutal when they have acquired an ease of living which gives them a higher sense of values. It is a tragedy which impends like a sword of Damocles over civilization to-day.

Space forbids more extensive quotations, but we cannot omit the author's criticism on the laboratory attempts to interpret the nature of matter from the results of violent splitting of the atom: "Are we to discover the intelligence involved in the erection of a noble cathedral from the manner in which it is blown to pieces?" We must be content simply to refer the reader to his views on the origin of life (p. 207).

The book "is addressed to Youth, because only youth will dare to tread a path so startlingly new." Yet its newness is not so subversive of older philosophies as to render its pages unpalatable to those of riper years, who are as alive to our present dangers as are the most callow. We have read it with great interest, though we might suggest as a more descriptive if less sensational title, "The Immanence of Intelligence."

THE BIOGENIC AMINES

Die biogenen Amine. By M. Guggenheim. (Pp. 564. No price given.) Basel and New York: S. Karger. 1940.

Dr. Guggenheim has long been recognized as the outstanding authority on the amines present in organisms, and all biochemists will therefore welcome the appearance of the third edition of his monograph on the biogenic amines and their importance for the physiology and pathology of vegetable and animal metabolism. The last edition appeared in 1924, and knowledge in this field has advanced greatly since that date; hence the present volume is practically a new work. The author remarks that the increase in knowledge has been so great that it is no longer possible to make a complete presentation of the subject in a single volume.

The monograph gives a full account of modern knowledge of well-known and important amines such as acetylcholine, histamine, and adrenaline, and also provides a systematic survey of their less famous relatives. This latter feature is of special importance because it is so much easier to obtain information about well-known substances than about substances which have not attracted general attention. Besides describing the amines that occur in nature the author also mentions the additional forms produced by the organic chemist. The number of these precludes more than a bare description. For example, a simple list of the known phenyl alkyl amines occupies ten pages, while a similar list of the homologues of choline occupies eight pages.

Dr. Guggenheim has managed to compress an enormous amount of information into a single volume, and biochemists and physiologists in general will be very grateful to him for the labour he has expended in providing an authoritative account of an important and difficult subject.

APPLICATIONS OF X RAYS

Applied X-Rays. By George L. Clark, Ph.D., D.Sc., Professor of Chemistry, University of Illinois. Third edition. International Series in Physics. (Pp. 674; illustrated. 42s.) London: McGraw-Hill Publishing Company, Ltd. 1940.

The third edition of this book contains an up-to-date account of the applications of x rays in science and industry. The direct medical interest in the work is very limited. A paragraph or two are spared to the subject of medical radiography. There is a fairly comprehensive chapter on the biological effects of x-radiation, which includes a brief outline of work on radiogenetics. The effects of radiation on normal and pathological tissue are summarized. This part is of restricted value from its very brevity. For example, on page 213 the statement, "28 and 34 per cent. respectively of an erythema dose (600 r), effective in the ovaries, will produce temporary and permanent sterilization" has little value without reference to the patient's age; and the "statistics of the cancer problem" can hardly be summarized adequately in a short paragraph of a dozen lines, as on page 219.

The technique of radiotherapy does not come into the scope of the work. The physics of *x*-radiation are dealt with concisely and clearly, though the chapter on "Scattering and Absorption" is too sketchy to be very informative. There is a condensed account of the modern method of describing the vector model of the atom. A superficial knowledge of the rules of quantization is assumed.

The main interest of the work lies in the last two-thirds, which is devoted to an excellent account of *x*-ray analysis of the ultimate structure of materials, both organic and inorganic. Of particular merit is the chapter on the fundamentals of crystallography and *x*-ray methods of crystal analysis, which will prove helpful to research workers taking up this study. The later chapter on the interpretation of diffraction patterns presupposes familiarity with the complex mathematics of the atomic and crystal "structure factors." Finally there is a discussion of some practical applications in the metallurgical industry and in the study of synthetic materials.

Notes on Books

Dr. HUGH MORRIS'S *Medical Electricity for Massage Students* was commended in these columns as a clear and practical textbook when the first edition appeared six years ago. A second edition is now published by J. and A. Churchill at 18s., and the author in his preface says that it differs so much from the first that it is really a new book. He has revised and compressed the material, and added new chapters on diathermy and ultra-violet rays. It is essentially for the groundwork it provides that Dr. Morris's book is valuable, and mastery of its contents will give a sound basis for all the more advanced electrical work.

A second edition has been published by Dale, Reynolds and Co., Ltd., at 1s. 6d., of Major NORMAN HAMMER'S pamphlet *First Aid for War Casualties*. This handy practical guide first appeared in September, 1940, and went rapidly through four reprintings. The material has now been brought up to date and enlarged. In its revised form the pamphlet will no doubt have a ready sale among those engaged in civil defence first-aid work. The author has had large experience in ambulance work, and was for some time medical adviser to the Home Office A.R.P. Department.

A review of Dr. ALBERT C. SNELL'S *Treatise on Medicolegal Ophthalmology* appeared in the *Journal* of May 17 (p. 753). The publisher of the book in this country is Henry Kimpton.

Preparations and Appliances

FIXATION OF SKELETAL TRACTION PINS

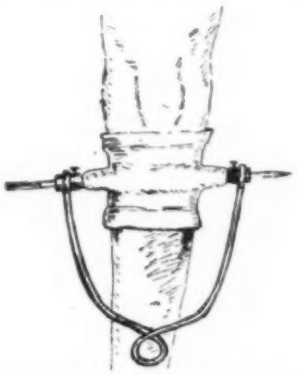
Mr. D. V. MARSHALL, M.B., F.R.C.S.Ed., F.R.F.P.S.G., writes:

At the Beverley Road Hospital, Hull, some five years ago skeletal traction for the treatment of fractures of the lower extremity requiring prolonged extension was adopted almost as a routine. It was found that, apart from the accepted general efficacy of the method, the nursing of the cases was made much easier and pressure sores of all kinds were avoided.

Many of the patients who had to be treated were elderly, in poor condition, restless, non-cooperative, and occasionally demented. It was noticed that when through these causes the transfixion pin slipped transversely or by rotation, or because it had not been driven at right angles to the traction axis, infection developed at an early date. In other cases, where there was no slipping or working on the pin, infection did not occur. These results were noted constantly, irrespective of whether the skin wounds around the pin exits were dressed by various methods or left exposed. Having regard to these observations, attempts were made to devise some mechanical means to prevent the pin moving either transversely or by rotation in the tissues. Experiments were tried with various distance pieces screwed on the ends of the pin impinging on the bone through the soft tissue, and with fins on the pin (Smith Petersen style), but the results were not encouraging, and the apparatus was costly to make up. Accidentally, it was discovered that an arrangement with plaster-of-Paris described later solved the problem.

The results have been so consistently good, whether used in the elderly, the demented, children, adults, or air-raid casualties, that it is felt the method is worth recording.

The average case under my care has the pin left in until the need for extension ceases, usually eight weeks, with gradual reduction of the weight from six weeks onwards. On many occasions the pins have been left in for ten to twelve weeks.



In no case has there been any sepsis or trouble of any kind, and all the pin tracks have healed at once when the pins were removed. I have not noticed the method in use in any other hospital, or heard of it from other surgeons, though it is more than likely that others have devised similar measures with similar results.

The method is shortly as follows: A Böhler's or Steinmann's pin is introduced through the tubercle of the tibia, condyles of femur, or os calcis, or other site, as may be suited to the particular case. The skin around the pin is painted with picric or a similar antiseptic, and a paster-of-Paris bandage is applied immediately around the leg and pin in the form of a collar three or four inches wide. The distal and proximal margins of the plaster collar are prevented from pressing injuriously upon the skin by pieces of white felt. The extension stirrup having been applied, distance pieces integral with the collar are formed by winding the bandage round the pin outward to the stirrup bushes. The plaster is moulded carefully with the hands to fit leg and pin as it sets, and no dressing is used between the skin puncture and the plaster.

The method has been found satisfactory even when the pin is not driven square, and it can be used to give oblique traction in fracture-dislocations of the ankle or knee. The accompanying sketch illustrates the arrangement.

The annual general meeting of the London and Counties Medical Protection Society was held on June 18 under the chairmanship of Sir Cuthbert Wallace. The annual report stated that during the past year 1,192 practitioners had been elected to membership, 917 of them within twelve months of their registration. The losses by death, resignation, or default numbered 690. Over 1,000 applications for advice and assistance from members were received during 1940—a decrease as compared with the previous year, but including a larger number than usual of serious cases. It is pointed out that no practitioner, however competent or discreet he may be, and to whatever branch of the profession he belongs, is immune from litigation on account of his professional work, and that practitioners holding Government or municipal service posts have just as much need of protection as those in general or private practice. Service with H.M. Forces does not relieve an individual of his civil obligations, and the experience of the past year has demonstrated the soundness of the advice given to Service members that they should continue their membership. A few of them have resigned in spite of this advice, and some have realized later that such discontinuance was unwise. During the year over 600 matters were referred to the solicitors, many of them concerning altered circumstances arising out of the war. An unusually large number of cases have been defended in the courts, mostly with satisfactory results. The accumulated funds of the Society amount to just upon £80,000. At the meeting Sir Cuthbert Wallace was re-elected president, Dr. G. F. Stebbing chairman of council, Mr. W. M. Mollison treasurer, and Dr. R. W. Durand secretary.

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THE DANGERS OF DUST

One of the major lines of medical progress during the present war has been the study of air-borne infection. The effect of this intensified study has been profoundly to alter our conception of how infection is spread through the air, and in fact largely to restore beliefs which were chiefly current half a century ago. Dust has always been recognized as a vehicle of infection, but it was relegated to a secondary status by Flügge's work on the aerial dispersion of fluid particles from the upper air passages, and "droplet" infection has been regarded almost throughout this century as the principal mechanism by which pathogenic bacteria of many kinds are able to travel from person to person. This belief had to be qualified more recently in view of Wells's work on the behaviour of fluid particles in air: he showed that in an ordinary atmosphere a drop of fluid either falls to the ground or, if smaller, evaporates before it reaches the ground, leaving a "droplet nucleus" which remains suspended in the air. These particles if derived from natural secretion would consist of dried mucus containing bacteria which are known to be capable of survival in them for hours, or even days. Droplet infection of the more distant kind was thus merely translated into terms of droplet nucleus infection: the material concerned is certainly dust, if you will, but the supposition remains that suspension in the air continues until the micro-organism reaches a new host.

It is chiefly in connexion with streptococcal infections that even this qualified belief in Flügge's original doctrine has now apparently to be abandoned. To apply conclusions recently reached about the behaviour of pyogenic streptococci outside the body to infectious disease generally is unjustified; it remains possible, and indeed likely, that purely aerial spread is the important mode of transmission of some of the specific fevers and of many infections involving the air passages and lungs. We have little new knowledge on these subjects: on the epidemiology of streptococcal infections we have much. There have been strong motives for acquiring it, of which the foremost was the deplorable mortality from puerperal fever. There is a peculiarly exact method of acquiring it, thanks to the immense achievement of the late Frederick Griffith in establishing the thirty serological types of *Streptococcus pyogenes* by which his name will always be remembered. Aided by this delicate means of tracing the migration of a streptococcus from patient to patient, ward epidemics have been increasingly studied, and it is now widely known that under the average hospital conditions one patient may infect many others, the manifestations often varying from case to case, taking the form of a wound infection in one and a throat infection or otitis media in another. These epidemics have always existed, particularly among children, and (as was first clearly pointed out by the late C. C. Okell) in ear, nose, and throat wards; they become a major and constant problem where large numbers of war wounds have to be treated. Exactly how infection spreads in these circumstances is therefore a question of the first importance.

There are certainly two main avenues to be considered, one of which is contact infection. That imperfect technique does lead to the direct transference of streptococci, particularly from wound to wound, has been well brought out by the recent observation of A. A. Miles and his collaborators.[1] The alternative route is aerial, and here the patient suffering from a throat infection or the "throat carrier" has been looked upon as the usual source, and the vehicle of infection as the infected particle suspended in the air. There are two reasons for altering this view. One is the recent work of R. Hare,[2] who studied the expulsion of infected droplets by streptococcus carriers by an ingenious method involving the exposure of blood-agar plates disposed round an arc of a circle whose centre was the carrier's mouth. He found that haemolytic streptococci are ejected only in comparatively small numbers, and that they are contained chiefly in large droplets which fall rapidly, forming colonies only on those plates in his experiments which were below the mouth rather than on those level with it. There is much conflicting evidence about the extent to which bacteria are ejected from the mouth in talking, and a factor often overlooked is that pathogens may be localized in a particular area in the throat, whereas indicator bacteria such as *Chr. prodigiosum*, used in experiments on this point, are universally distributed throughout the mouth. Earlier observers have also failed to detect the expulsion of haemolytic streptococci by carriers in a manner and on a scale which would explain their supposed aerial infectivity. On the other hand, while the suspended droplet has been slowly falling into discredit, dust as a vehicle of infection has been receiving more and more attention and the support of many practical observations. We referred recently[3] to the studies of H. D. Wright and his colleagues on cross-infection in diphtheria wards: they found large numbers of virulent diphtheria bacilli in ward dust and established that these were capable of survival for at least a month. That haemolytic streptococci can exist in the same medium has been proved repeatedly, and ward dust, particularly that shaken up during the process of bed-making, must now be regarded as a major source of danger.

There are two ways of combating this, directed respectively to the floor and to bedclothes. The treatment of floors with spindle oil, as recommended by M. van den Ende, D. Lush, and D. G. ff. Edward,[4] is simple as well as effective. The "oiling" of blankets, which are readily contaminated by patients and at the same time a prolific source of ward dust, is not so easily carried out. When the necessary apparatus is available the result is not disagreeable to the patient, and the effect is striking. With the collaboration of van den Ende the process has been given a practical trial in two hospitals, experience in one of which he describes with E. T. C. Spooner,[5] while in another the results are

[1] *British Medical Journal*, 1940, **2**, 855, 895.
[2] *Canad. publ. Hlth. J.*, November, 1940, 539.
[3] *British Medical Journal*, February 15, p. 247.
[4] *Lancet*, 1940, **2**, 133.
[5] Ibid., 1941, **1**, 715.

described on page 953 of our present issue by van den Ende and Major J. C. Thomas. Here elaborate observations were made which reveal the very large numbers of streptococci that may be contained in blankets and in ward dust generally, and confirm the increase in atmospheric contamination that results from bed-making and other disturbances. The oil treatment of blankets is strikingly effective in reducing this, and its general adoption will have to be considered seriously. No one reading these papers can deny that our whole outlook on the epidemiology of streptococcal infections has been altered, and that preventive efforts must take a new direction. To correlate Hare's findings with recent studies on dust, it must be concluded that large droplets of secretion drying on bedclothes and floors are the chief agency in spreading infection from the air passages: exudates drying on dressings and plasters doubtless behave in the same way when the source of infection is a wound. Other ways of dealing with the dust problem will no doubt be devised, but in the meanwhile oiling in both its forms deserves an extended trial.

A WARTIME SURVEY

The wealth of the Rockefeller Foundation flowed from oil, and by the irony of fate its beneficent work is now ruthlessly curtailed by the struggle for the power that oil can give. This makes Dr. Fosdick's review of the year's work of the Foundation grim reading. All over Europe its activities have been brought to a standstill, for " in the shadows that are deepening over that continent the lights of learning are fading one by one. The conception of knowledge as an international responsibility has vanished. . . . As German forces have moved into one country after another a definite pattern has been followed." Where this was resisted, faculties were sent to concentration camps and student demonstrations were broken up with machine guns and tanks." The condition of university life and standards on the Continent is now little short of appalling. Due to flight, imprisonment, or disappearance the number of professors has been reduced by at least 50%." The same applies to the Baltic States absorbed by Russia. Even in neutral countries scholars are under pressure to follow a totalitarian interpretation. The German Minister of Justice gave as his opinion that the old ideal of objectivity is nonsense: the one question must be, Does my scientific work serve the welfare of National Socialism? But, " In all the history of the race knowledge has never flowered in a subject people . . . it is only through free thought that the soul of a people can be kept alive."

Turning to brighter topics, Dr. Fosdick reports the success of the campaign against the *Anopheles gambiae*, the dreaded malaria-carrying insect which was imported from Africa to Brazil by an airplane or fast French destroyer plying from Dakar. The virulent outbreak of malaria which followed is an interesting example of the fact that epidemics travel at precisely the rate of human intercourse; formerly at the speed of a horse or sailing vessel, now at that of a plane. Thanks to the efforts of Dr. Soper and his staff no evidence of *gambiae* in Brazil was found in the last forty-seven days of 1940, though probably certain mopping-up operations remain to be done. A sharp outbreak of yellow fever in the Sudan led to the Foundation's supplying a quarter of a million doses of vaccine, and preparations for the supply of at least a million in all. Their researches show that yellow fever is primarily a disease of jungle animals; the virus circulates in the blood of susceptible ones for only three to four days, and does not subsequently reappear. Mosquitoes, however, once infected tend to harbour the virus for the remainder of their lives.

After detailing several other activities of the Foundation Dr. Fosdick goes on to an interesting discussion of the sharp attack on science resulting from the growing public realization that its powerful tools can be used for man's enslavement and destruction. Power can be used by evil men to do evil even more than it can be used by men of good will to do good; but, as he says, this is true of many things in life, and he quotes Prof. Dewey to the effect that the spread of the scientific attitude is the sole guarantee against wholesale misleading by propaganda. The question for the social sciences is how can the social adjustment of millions of human beings be arranged with less frustration and more harmony and justice. The hard fact is that improvisations will not do.

There is much food for thought in this report of disasters and successes, of expectations and of fears. One striking fact emerges—the total expenditure for the year on all the beneficent work of the Rockefeller Foundation was roughly 2¼ million sterling, a trivial sum contrasted with the cost of the destructive forces at work to-day.

THE LESION OF PNEUMOCOCCAL LOBAR PNEUMONIA

The criteria for the experimental production of pneumococcal lobar pneumonia were laid down by Blake and Cecil[1] in 1920. The cocci must be deliberately placed in the lumen of the trachea or of a bronchus in a susceptible animal. Subcutaneous or intravenous injection gives rise to septicaemia with very occasional secondary lung lesions or is without effect; inoculation into the nasal or upper respiratory passages is usually negative. Blake and Cecil suggested that the infection traversed the lung from its hilum as a wave of acute spreading lymphangitis of the interstitial tissue, the cocci travelling in the peribronchial and perivascular lymphatics, the alveoli being invaded from without. On this view the peripheral parts of the lung should always show oedema or early consolidation when the lesion at the hilum shows well-developed lobar consolidation. The conditions laid down by Blake and Cecil have become part and parcel of the experimental study of lobar pneumonia, but their conclusions regarding the evolution of the lesion have been strongly attacked. Loeschcke,[2] in 1931, examined the lungs of forty-seven fatal human cases of lobar pneumonia and claimed to have discovered the primary focus of infection in them all. According to Blake and Cecil this should have been found near the hilum. Loeschcke always found it to be at the periphery, usually in a dorsilateral position. He satisfied himself that the spread of infection was from alveolus to alveolus through the pores of Kohn, that the infective agent was freely flowing oedema fluid in which very large numbers of pneumococci were growing but in which cells were scanty, and that as this fluid increased in volume it was spread by coughing and movement, travelling in the

1 *J. exper. Med.*, 1920, **31**, 403, 445; **32**, 401, 691, 719.
2 *Beit. z. path. Anat.*, 1931, **86**, 201.

small air tubes. Terrell, Robertson, and Coggleshall[3] produced lobar consolidation of the lungs in dogs by introducing pneumococci suspended in a viscous starch emulsion into a terminal bronchus by means of a fine catheter. They found spread to take place radially from the primary focus and the pneumococci to be carried in large numbers in oedema fluid which travelled along the small air tubes. Suspension of the inoculum in a viscid medium protects the pneumococci from phagocytosis, allows them to proliferate locally, and prevents their wide dispersion.

Hamburger and Robertson[4] have recently published an account of experiments which give strong support to the contention that lobar pneumonia spreads from a primary focus in the lung by aspiration into the fine air tubes of pneumococcus-laden oedema fluid. They have taken the matter further, and offer a reasoned explanation, founded on accurate experiments in dogs, of the mechanism of spread of the disease from lobe to lobe and lung to lung. The first problem was to determine the exact anatomical disposition of the main bronchi and their main lobar branches. This was done by making metal casts of the bronchial tree. Primary foci of lobar consolidation were then established at different sites in the lung in a series of animals by injecting pneumococci in 6% starch broth into a terminal bronchus. For each primary site the location and order of appearance of secondary lesions arising from it were determined. For instance, with a primary focus in the right lower lobe the secondary foci appeared in the right middle, right upper, and post-cardiac lobes in this order. Having regard to the fact that the habitual posture of the animals was prone with the head and upper thorax slightly lower than the rest of the body, and by reference to the metal cast, it was demonstrated that the factor deciding where secondary lesions shall appear and in what order is the flow, purely under the influence of gravity, of oedema fluid from the primary focus. It was repeatedly observed in those animals with secondary foci that the primary lesion was much more oedematous than when secondary lesions did not arise. In a word, the spread from lobe to lobe depended in the first place on the degree of acute inflammatory oedema in the primary lesion, and the situation of the secondary lesions in the lung on gravity. This is borne out by further experiments. Cultures from different parts of the lungs were taken from animals with a single lesion and from others with a primary and several secondary lesions. In the first group pneumococci were strictly limited to the primary lesion. In the second, the primary lesion being "wet" and oedematous, there was spread of oedema fluid, and pneumococci were found throughout both lungs. An attempt was then made to induce a secondary focus of pneumonic consolidation in a part of the lung remote from the primary focus by plugging with viscid fluid the fine air tubes to a lobe. This was done by injecting mucoid by a fine catheter introduced through a bronchoscope into the bronchus to a lobe. In a series of nineteen animals no secondary lesion developed in the "plugged" lobe in sixteen. It is therefore reasonable to conclude that the site of a secondary focus is not determined by absence of the normal mechanism for expulsion of fluid from the airways. A series of animals was then infected by injection of the freely flowing watery exudate taken from the air passages of dogs with severe lobar consolidation. Secondary lesions were readily produced by maintaining the animals in positions favouring the flow of fluid to the depths of the lungs, and lesions in various lobes could be obtained at will by varying the position of the animals. When viscid slowly flowing exudate from lesions showing less acute inflammatory oedema was used consolidation did not appear.

3 *J. clin. Invest.*, 1933, **12**, 393.
4 *J. exper. Med.*, 1940, **72**, 261, 275.

"THE BIRTH OF A BABY"

About eighteen months ago a film entitled "The Birth of a Baby," which had been produced by the American Committee on Maternal Welfare, was sponsored in this country by the National Baby Welfare Council. In some comment in these columns at the time it was remarked that the educative value of the film was undoubtedly high, though it had an opulent American setting which might make it seem rather unreal to the British mother, but that there was nothing in it to shock "even a congregation of churchwardens." Since then it has had to run the gauntlet of the licensing authorities, numbering in some counties twenty or thirty or more, and in others, like London and Middlesex, only one—namely, the county council. A striking difference in the attitude of the authorities to such a film is shown as between the north and the south and west of England. In Lancashire, out of 65 licences required, passes have been given in 58 cases, and refusals in 4, including Warrington and Blackburn. In Yorkshire, out of 55 licences required, passes have been given in 36, and refusals in 6, including Sheffield. In Northumberland and Durham, out of 57 licences required, passes have been given in 41, and refusals in 5 (the refusals include Durham city, where the authorities have declined three times even to see the film). On the other hand, in London, after a preliminary showing at Hammersmith, further licences for cinemas have been refused, and, as showing in town halls and similar buildings is impracticable, a further request is now before the Entertainments Committee. In Middlesex the county council will not permit it anywhere. In Cornwall, where, incidentally, the infant death rate is more than 2% above the average, the county council has refused to see it or pass it. Nevertheless, with many decisions still outstanding, the film has been approved by 77% of the authorities approached and has been seen by about two million people. In Lancashire helpful co-operation is reported from all the 26 boroughs that have passed it, and an excellent response from the public. In spite of anything that Shakespeare may have said, there remains a great amount of importance in a name, and although the film itself contains nothing to offend the susceptibilities of the public, a different title, such as "Safe Motherhood," might not have aroused the squeamishness which has operated against the film in certain quarters.

MILK SUPPLY IN TIME OF WAR

Before the war the total milk production of this country was about 1,500 million gallons per annum. Of this an almost constant amount throughout the year was sold in the liquid milk and cream market. During the summer months a considerable surplus was available for manufacture, and a much smaller surplus during the winter. Roughly equal quantities of milk were used for the production of cheese and of condensed and dried milk, and a quantity equal to these two together for the manufacture of butter. According to Dr. Norman Wright,[1] the Director of the Hannah Dairy Research Institute, who gives these figures, a fall in the total milk production of the country equivalent to 25% of the pre-war figure is to be expected in the near future if the present policy of the Ministry of Agriculture is continued. This will result in a serious shortage of liquid milk during the six winter months, amounting to about 73 million gallons. No surplus for manufacture will be available during the winter, and to make good the winter deficit in liquid milk practically the whole of the summer surplus will have to be used for the manufacture of condensed and dried milk. Only 7%, in fact, will remain for conversion into cheese and butter. It is doubtful whether the existing

1 "The Milk Supply in Time of War," *J. roy. agric. Soc. England*, 1941, **101**, Pt. ii.

plants could deal with the surplus available, and unless, therefore, dried and condensed milks were imported the country would have to reduce its milk consumption during the winter months to an undesirably low level.

Dr. Norman Wright analyses the position and is of the opinion that this fall of 25% could and should be avoided. Experience during 1914-18, when there was a similar fall, showed that it was due not to the increase of arable at the expense of grass land, but to the scarcity and high price of feeding stuffs and to a deterioration in the quality of cakes and cereals for cattle. Under the present rationing scheme preference is given to dairy cattle in the allocation of feeding stuffs, but though this will ensure an equitable distribution within each priority class, it will not increase the total amount of feeding stuffs available. In the last war the import of feeding stuffs for animals fell to 40% of the pre-war level, and there is reason to believe that in the present war an even greater fall may occur. The only remedy, therefore, lies in an increased home production of feeding stuffs for cattle. This might be done in two ways. First, more grass should be grown, particularly for use in April and August, in order to reduce the consumption of purchased feeding stuffs. Secondly, farmers should be encouraged to produce silage, using for this purpose herbage in the young leafy stage, when its nutritive value and protein content are at their highest. It is calculated that if every moderate-sized farm in the country were to produce only one 35-ton silo of high-quality material, which could be obtained from a single cutting of seven acres of good grassland, the result would be the conservation of three million tons of silage—an amount sufficient to produce over 300 million gallons of milk, or nearly the whole of the 25% anticipated deficiency. The production of milk constitutes the most economical method of converting feeding stuffs into animal products, and the maintenance of the milk supply should be the most important objective of wartime husbandry. It is to be hoped, therefore, that the suggestions put forward by Dr. Norman Wright will not only receive the careful consideration of the Ministry of Agriculture, but will, if sound, be translated into practice before it is too late.

CHEMOPROPHYLAXIS OF RHEUMATIC FEVER

We have referred before to the efforts made at two centres in the United States to prevent recurrences of rheumatic fever by prolonged administration of sulphanilamide. As much as 3 grammes daily has been given even to children for as long as eight months with no apparent ill effects, and rheumatic activity seems to have been suppressed while the drug was being taken. A further and more detailed account of this study at Baltimore, where it has now been in progress for four years, is given by Caroline B. Thomas, R. France, and F. Reichsman.[1] The subjects were out-patients leading ordinary lives, and were allocated to treated and control groups in such a way as to make the two groups as similar as possible. Two doses each of 0.6 gramme of sulphanilamide were given daily, the first on rising and the second twelve hours later, the resulting concentration in the blood varying between 1 and 3 mg. per 100 c.cm.; this treatment was begun each year in October and continued until the following June. Very few patients experienced any ill effects; only two patients during the past two seasons were transferred to the control group on account of intolerance, although others were also transferred who failed to take the drug regularly through forgetfulness rather than any objection to its effects. The results may be stated shortly by saying that during seventy-nine "person-seasons"—a season being the annual period of medication—involving fifty-five patients, there were no major rheumatic attacks, whereas fifteen such attacks occurred during 150 person-seasons in the control group of sixty-seven patients. It was also found by repeated pharyngeal swabbing that haemolytic streptococci were less often to be found in the throats of the treated group or were present in smaller numbers. None of the treated patients died; one control patient died from acute rheumatic fever and two of subacute bacterial endocarditis. Minor rheumatic manifestations were seen in two cases during treatment, and one treated case had a major rheumatic attack in August when medication had been suspended for the summer months. These findings seem to show clearly that rheumatic activity can be suppressed by sulphanilamide treatment and that the small dose which suffices can be taken without discomfort or interference with an ordinary life. It is interesting to speculate on the meaning of this effect with reference to the aetiology of rheumatic fever. It is, of course, possible that some agent other than the haemolytic streptococcus is concerned in producing the disease, and that this second hypothetical micro-organism is also susceptible to sulphanilamide. On the other hand, it is just as reasonable, if not more so, to regard the therapeutic argument as further evidence of the essential part played by haemolytic streptococci themselves. This evidence is only additional to an imposing mass of data accumulating from other directions. The serological studies of Coburn and others have recently[2] been extended with such results as to suggest strongly that streptococcal infection remains active throughout a rheumatic attack, while C. A. Green[3] and others have actually cultivated the organism from affected tissues, notably heart valves. It may well be asked why, if rheumatic fever is an infection by the *Streptococcus pyogenes*, the acute stage should not be amenable to sulphanilamide treatment; it seems to be generally agreed that it is not. This question may perhaps be countered by another: Why is sulphanilamide of so little benefit in scarlet fever? The haemolytic streptococcus is the most versatile organism we know; it has several weapons of attack, and the capacity to produce an astonishing variety of effects, not all dependent on the nature of the tissue affected. It may well be that certain forms of streptococcal activity are less amenable to chemotherapeutic control than others, and if we conclude that rheumatic fever is one of these, the fact of its resistance to chemotherapy may even afford a clue to its more intimate mechanism.

[1] *J. Amer. med. Ass.*, 1941, **116**, 551.

[2] *J. clin. Invest.*, 1939, **18**, 141.

[3] *J. roy. nav. med. Serv.*, 1939, **25**, 218.

Sir Charles Wilson, P.R.C.P., has been appointed Consultant Adviser in Medicine to the Minister of Health for the Emergency Hospital and Medical Services.

We regret to announce the death at the age of 57 of Robert Robison, D.Sc., F.R.S., head of the department of biochemistry at the Lister Institute of Preventive Medicine since 1931, and professor of biochemistry in the University of London. Prof. Robison joined the Lister Institute in 1913, and served with a commission in the R.A.M.C. during the last war. He received the Baly Medal of the Royal College of Physicians of London in 1933 for his distinguished work in physiology.

At the course arranged by the Ling Physical Education Association to take place at Leeds University on Saturday, July 5, Dr. M. Burbury, medical director, Manchester Child Guidance Clinic, will lecture on "Interactions of Mind and Body," and Dr. G. Prince, assistant school medical officer, Leeds, will open a group-discussion on "Co-operation between the School Medical Officer and the Gymnastic Teacher."

CHEST SURGERY IN WAR

This is one of a short series of articles based on lectures given at the British Postgraduate Medical School, Hammersmith

CLOSED WOUNDS OF THE CHEST, AND THE PHYSICIAN'S PLACE IN A CHEST TEAM

BY

J. A. NIXON, C.M.G., M.D., F.R.C.P.

Changes in climate, the nature of the soil, the character of weapons and missiles, render the aspect of gunshot wounds of the chest exceedingly variable. In the South African War it was decided that chest wounds were best left to the natural processes of cure. In the war of 1914-18 sepsis was so frequent in all varieties of chest wound that by 1916 Duval of the French Army and Gask of the British Army first began to apply the general rules of surgery to lung wounds. In July, 1917, a meeting of consulting surgeons and physicians drew up a memorandum which was communicated as a guide to all medical units.

A Guide for Medical Units

Briefly the following rules were laid down:

1. An open pneumothorax should be temporarily closed by suture at the earliest opportunity, either at the field ambulance or C.C.S. If suturing is impossible the wound should be packed and strapped to render it airtight.

2. Extensive parietal wounds, including the above, should be treated as any other large wound, and comminuted rib fragments removed.

3. A large foreign body shown by radiographs to be accessible should be removed, haemothorax evacuated, and the chest closed. Bullets or small fragments may be left.

4. Any large haemothorax attended by persistent respiratory distress should be aspirated; this is best done after a lapse of forty-eight hours.

5. Gross infections may be treated by rib resection and drainage. Mild infection may be closed after thorough cleansing of the pleural cavity.

6. Set operations should not be performed until initial collapse has passed off.

7. Always close a wound of the diaphragm discovered at a thoracotomy.

8. Any case subjected to open thoracotomy must be retained for ten days after operation.

9. Reliable *x*-ray plant and immediate access to a pathological laboratory are essential to successful chest surgery.

These rules made a great change in the number of cases left to expectant treatment. Gask estimated that perhaps 25% of cases needed surgical treatment in the first twenty-four hours; even through-and-through rifle-bullet wounds often become septic. Captain Mann of No. 3 Canadian C.C.S. (with whom I worked for a short time in 1917) noted that septic empyemata were not more common with retained missiles than with through-and-through wounds, and that fragments of high-explosive missiles showed only a slighter tendency to become septic than did rifle bullets. Of cases with retained foreign bodies (10% bullet, 90% shell) 16% developed septic haemothorax at the C.C.S. (11% bullet, 89% shell). Of cases without retained foreign bodies (39.5% bullet, 60.5% shell) 21% developed septic haemothorax (20% bullet, 80% shell). The determining factor seemed to be the character of the wound rather than the nature of the missile. Injuries to ribs and laceration of soft parts were mainly responsible for the production of sepsis.

So it came about that the proportion of cases that would from choice (not military necessity) be left to expectant treatment was small. The idea that "closed wounds" as a whole class do not need surgery is dangerous. This is especially true of "stove-in chests" with several ribs smashed and driven in without any penetrating wound. These are veritable "closed wounds," but it was universally agreed that they required immediate operation.

During the summer of 1917 Major Lockwood (of Toronto) and I had the good fortune to be so stationed at Zuydcoote, near Dunkirk, that we received our chest cases direct from the line. They came to us at No. 36 C.C.S. without stopping at a field ambulance. The Passchendaele battle did not affect us, except that no ambulance trains could be spared to take our cases to the base, so we kept our patients through to convalescence. In parenthesis I may remark that we shared the vast sanatorium at Zuydcoote with the French Mobile Surgical Unit 21, of which Prof. Duval was the chief surgeon. We worked there from August to November, 1917. The total number of "G.S.W. chest" admitted was 168; operations were performed on 82, and non-operated cases amounted to 86. Of the non-operated cases 9 were brought in dead, 21 died within a few hours of admission, yet 55 survived. It appears that we refrained deliberately from operation in only 56 cases. As I look through the fatal non-operated cases I think No. 48 is the only one upon which we decided of free choice not to operate. The results of this group of cases turned the scale in favour of early operation rather than early evacuation to the base.

I have one other set of figures of Lockwood's and mine. In September, 1916, 203 cases were admitted to a special chest ward at Heilly. Of these only 16 died in the C.C.S., but this low death rate is partly explained by the fact that abdomino-thoracic injuries were taken into surgical wards and classified separately. I do not know what was the after-history of the 187 cases evacuated to the base; but of the 168 cases at Zuydcoote 113 lived and were discharged by us convalescent. Lockwood noted in his paper that the figures showed a high percentage of recoveries in cases that previously showed a mortality of nearly 100%.

I lay stress on this experience because it shows how few cases a physician will choose to treat expectantly. Perhaps the prophylactic use of sulphanilamide may justify a change in practice.

Classification of Cases

It comes to this, then: there were very few "G.S.W. chest" that, in the climate and soil conditions of France and Flanders, a physician would choose for expectant treatment. But circumstances may compel expectant treatment—for example, the absence of surgical facilities or, even with these facilities, the absence of radiographic facilities; or the patient may be unfit for operation owing to the severity of the intrathoracic injuries, the severity of external or complicating wounds, loss of blood, or collapse or shock due to cold or transport. Allowing, however, for such considerations, there remain two classes of "closed wound" which the physician may be allowed to look after: (1) the cases in which no operation has been deemed necessary and the patient's condition is good; (2) the cases

upon which operation has been performed and in which the surgeon has closed the chest. No physician without experience of war surgery of chest wounds is competent to select cases for Group 1.

Early Aspiration

The whole plan of treatment of closed wounds may be summarized in a short sentence: No fluid, whether blood, serum, or pus, must be allowed to collect in the chest. Early and frequent aspiration must be resorted to whether thoracotomy has been performed or not.

As a rule it is injudicious to aspirate for either pneumothorax or haemothorax immediately after the wounding. Occasionally it is obvious from the urgency of the dyspnoea that relief might be obtained by immediate aspiration. Sometimes this becomes evident after resuscitation has been tried without success or with only partial success. The patient recovers partially from his shock and, as he recovers, dyspnoea, which is often absent while the respirations are feeble and shallow, begins to show itself. It is important to recognize that urgent dyspnoea with cyanosis soon after wounding is more pronounced in cases of extensive collapse or deflation of the lung without much haemothorax or pneumothorax than in cases in which the latter conditions are unaccompanied by collapse of the relatively uninjured lungs. A useful point in diagnosis is that haemothorax or pneumothorax pushes the heart away, whereas collapsed lung pulls it.

The post-operative aspiration of a chest must conform to the one rule that no fluid must be allowed to collect in the pleural cavity. Looking back at Lockwood's cases I find it was the rule that a chest closed at operation was explored eighteen hours later. Exploration was usually repeated several times. Cultures were made, but the discovery of pyogenic organisms or pus did not mean that the chest was reopened and drained. We always tried repeated aspiration. Lockwood's comment on this point was: "The rapid recovery by aspiration from an empyema infected by aerobes and anaerobes demonstrates that repeated aspiration should be resorted to before considering resection and drainage. The mortality of the latter operation in chest wounds at C.C.S. is nearly 50%." Lockwood's rules should be adhered to.

> "Chest cases should be nursed in the open air if possible. Aspiration is carried out as a routine eighteen hours after operation and at the end of the third day. Exploration of the chest is performed at frequent intervals whenever an accumulation of even small quantities of fluid is suspected, and fluid, if found, is removed by aspiration. Fluid must not be allowed to collect after operation. Physical signs are misleading, and nothing but repeated use of the exploring syringe and aspirator, aided by *x*-ray examination, will keep a chest safely emptied of fluid. Non-operated cases should be treated precisely as post-operative cases."

It is noteworthy that open drainage did not come into his scheme.

We did not recognize in the war of 1914-18 a separate class of "blast injuries" of the lung such as has been described amongst the air-raid casualties of the present war, and I have not seen enough examples to express any opinion about such injuries. It must be realized that the victims of air raids reach hospital alive with injuries to which a soldier succumbs on the battlefield, and we know that 50% of all chest wounds resulted in death on the battlefield in the last war. No one knows whether "blast injuries" contributed to these deaths.

The Physician's Place in a Chest Team

Now I want to say something about the physician's place in a chest team, because there is always a definite place for a physician. One of his first duties is to decide as to the intrathoracic injuries in the following way: Is there a sufficient degree of pneumothorax, haemothorax, collapse of lung, laceration or haematoma of lung, injury to heart, pericardium, or great vessels, injury to diaphragm and abdominal viscera, or injury to vertebrae or spinal cord to account for the severity of the symptoms?

Radioscopy and radiography are indispensable in order to reach a correct conclusion on these points. If the patient is unfit to undergo immediate *x*-ray examination the decision is easier. He is unfit for any immediate operation save one of the following: immediate and rapid operation for the arrest of visible haemorrhage from the chest wall or thorax; arrest of haemorrhage from coexisting wounds; aspiration for relief of pneumothorax (usually valve pneumothorax); aspiration for relief of haemothorax; temporary closure of open pneumothorax.

Duval pointed out the immense value of blood-pressure observations in the differentiation of shock from haemorrhage. The patient must be kept warm and every half-hour the blood pressure be gauged by the sphygmomanometer. In cases of pulmonary haemorrhage great care must be taken not to lower the head and not to administer subcutaneous or intravenous injections. If the blood pressure progressively falls operation is indicated, as haemorrhage is outweighing shock. It must be realized that a patient with a simple through-and-through wound or one with a small missile retained should not be profoundly collapsed or in great respiratory distress after being kept warm and at rest for an hour or two. If at the end of this time the condition has not improved the following possible causes must be considered in addition to the intrathoracic lesions just mentioned: haemorrhage, severe parietal and external thoracic injuries, diaphragmatic and abdominal injuries, and multiple wounds other than abdomino-thoracic.

Haemorrhage

This may have been very large in amount, and there may still be active bleeding. As a rule with closed thorax the amount of intrathoracic haemorrhage will not of itself be enough to produce severe shock. When there is an "open thorax" the estimated size of the haemothorax is no guide to the quantity of blood lost, as the greater part of the bleeding may have been external. In such a case physical examination is of little assistance beyond determining that there is an "open thorax" and that the patient is suffering from loss of blood. If the missile has been retained it is of the greatest importance to locate it accurately by radiographs. Signs of increasing effusion after twenty-four to thirty-six hours are scarcely ever due to active haemorrhage. Lockwood and I saw only 5 cases of recurrent haemorrhage.

Severe Parietal and External Thoracic Injuries

Comminuted fractures of ribs, scapula, or sternum produce the gravest symptoms even in the absence of severe intrathoracic injuries. It is of the utmost importance in such cases to determine the extent of the intrathoracic or pulmonary injury. Physical examination by auscultation and percussion is difficult to perform and more difficult to interpret. It will give little information beyond establishing the presence or absence of haemothorax or pneumothorax. But it is essential for the surgeon to know beforehand whether his operation should be limited to the parietes or should extend to the interior of the thorax. As a general rule, if the entrance wound is small and clean and there is no comminution of bone, whilst the extensive bony injury is confined to the exit wound, there will be no in-driven fragments, and the operation may be limited to the parietes. But if the entrance wound is large, if there are in-driven fragments of bone or pieces of clothing, and especially if a large missile is retained, the operation must extend to the interior of the chest.

Associated Injuries

Careful attention has always to be paid to injuries other than purely thoracic which may have been caused by the missile or missiles which have struck the chest, particularly injuries of the diaphragm and abdominal viscera. A prompt decision must be made as to whether there is sufficient thoracic injury to produce the symptoms or whether the thoracic injury may be ignored and a further explanation be looked for below the diaphragm. To the surgeon a definite and reliable opinion expressed by the physician that the intrathoracic injury is negligible is of great assistance. In order to form a definite opinion in such a case, physical examination of the chest becomes more important than in the class of case previously considered. If the heart is not displaced; if there is no great degree of surgical emphysema; if there is no large amount of air or fluid in the chest; but, above all, if there is a fair degree of air entry into the lungs, it may be assumed that, although the missile has entered the chest, the grave lesion exists elsewhere. In a through-and-through wound the track of the missile may make it obvious that no important structure has intervened; failing this, radiographs will be required unless the presence of an abdominal injury is made clear by other signs and symptoms. Abdominal rigidity and immobility are not by themselves clear indications of abdominal injury; these signs are often present in pure chest injuries. Increased dullness in the spleen area, haematuria, the presence of dullness in the flanks, localized tenderness and pain in the abdomen, the peculiar "catchy" breathing suggestive of diaphragmatic injury, and hiccup are signs that should be noted and interpreted as indicating injuries below the diaphragm.

Spinal Injuries and Multiple Wounds

Spinal injuries demand recognition, and not merely those which involve the actual spinal cord. Injuries to the body or processes of vertebrae may cause the gravest symptoms and present very puzzling features. Excessive pain, radiating very irregularly, is constantly met with in injuries of the vertebral bodies, and resembles the intense and erratic pain due to erosion of the vertebrae by aneurysm. Profound collapse which resists all efforts at resuscitation is often seen in spinal injuries, even when the cord is undamaged.

Apart from the associated injuries which the missile entering the chest may have produced, there may be other wounds that make it difficult to decide whether the patient's serious condition is attributable mainly to the chest wound or not. Here, again, if there is fair air entry into the lungs, the intrathoracic injury may be put on one side. A patient with one lung expanding well should not be greatly distressed even though the other lung is completely out of action, provided some hours have elapsed to allow him to adjust himself to his new conditions, and provided he has been kept at rest.

Mr. Thomas Johnston, M.P., Secretary of State for Scotland, has urged Scottish local authorities to improve their schemes for the relief of people rendered homeless by enemy attack. In a memorandum issued by the Department of Health for Scotland the authorities are instructed to make certain that their plans will actually work even in the severest conditions. The rest centre and billeting organization in each area ought to be so efficient that the local authority will be able to deal with its own homeless no matter how severe the raid may be. The Secretary of State is convinced that while much preparatory work has been done by local authorities the relief scheme can be still further improved. He attaches the greatest importance to the testing of emergency relief organizations, and urges every local authority to arrange rehearsals on as large a scale as possible.

MEDICAL PLANNING RESEARCH

MANIFESTO BY THE "YOUNGER HALF"

The following letter, signed by forty-eight members of the medical profession, has been received for publication.

SIR,—The nature of the war has made it clear that a considerable degree of peacetime reconstruction of all kinds will be inevitable, and the Government have already recognized this by the appointment of a Cabinet Minister to inquire into some of its aspects. Medicine will unquestionably be affected, and we feel that serious consideration should be given now to its future needs. There are many signs that the younger doctors in the country appreciate this, and it is our aim to collect and co-ordinate their thoughts so that they can be clearly stated at the proper time. We are aware that the B.M.A. have set up a Planning Commission, and other bodies have set up committees with similar purpose, but we feel that there need be no conflict. While we wish to emphasize the views of the younger half of the profession, we also hope to enlist the sympathy of many of our seniors, and will welcome their support and criticism.

Three Guiding Principles

We therefore invite all who agree with our guiding principles to join us. Our principles are three:

1. In assessing the past, and in planning the future, we will proceed by scientific methods. We will collect all available evidence, we will believe according to the evidence, and we will admit ourselves wrong whenever we are shown to be so by the evidence. So far as is humanly possible, we will examine all proposals (and the evidence on which they are based) without prejudice. We will give to tradition and custom their due weight, but not more than their due weight, and we will not disregard a thing merely because it is old, nor regard a thing merely because it is new. By so doing we hope to avoid unseemly squabbling and makeshift compromise, and at the same time achieve a high degree of unanimity.

2. We regard committees, congresses, and meetings as valuable for exchanging ideas, but of much less value for scientific research, executive work, or practical planning. Our decision is reinforced by the practical difficulties of geography and transport, which make such meetings impossible at the present time. Our proposed plan of campaign, outlined below, enables all who care to do so, including doctors serving in the Forces at home or abroad, to express their considered views, and the reasons behind their views.

3. The first consideration of all planning and proposals must be the maximum benefit of the maximum number of patients. The second consideration must be the conditions of work of those who serve the patients (doctors, nurses, lay administrators, almoners, technicians, etc.). Where these two clash, the first must have precedence. But, unless both are considered, the first will be nullified.

Since we wish to press our claims on their merits as objective, scientific, and practical proposals rather than as having the backing of so many thousands of supporters, we invite only those who are prepared to co-operate *actively* to join in our research. Co-operation can take either or both of two forms. We give below a list of subjects which we propose to consider. Any member may choose one or more of these subjects and prepare a draft report (giving a summary of the present situation, together with his proposals for the future). The time allowed for this preliminary drafting will be three months. It is hoped to have at least three *drafting members* reporting on each subject, and on the major subjects considerably more. When the drafts on each subject have been received, they will be collated, and a single "preliminary" report prepared. The work of collating will be carried out by an editorial group composed of the signatories of this letter and any who will volunteer to join them. Each of these preliminary reports will be submitted to *all* members for comment and criticism. The criticisms and comments will be studied, and wherever they are an improvement on the preliminary reports they will be embodied. Thus a series of final reports will be prepared, and we hope to issue these as a book. When this stage is reached our task will be ended.

Ordinary or critical membership is open to all. It is intended that in most cases drafting membership will be for any doctor or dentist who has been qualified less than twenty-one years, or for any final-year medical student, nurse, lay administrator, almoner, dispenser, hospital technician, or other person interested in or connected with our health services who is not over 45 years

of age. The membership fee in either case is 10s. 6d. This is necessary to cover clerical costs and postage; further, we believe that those who have something worth saying will think it worth while to pay 10s. 6d. to say it, and that those who have not will not. Prospective members should send their subscriptions to Dr. Kenneth Perry, the Connaught Hospital, Walthamstow, London, E.17. Critical members must bear in mind that they can anticipate nothing beyond a receipt for at least five months; only then will the first preliminary reports be ready. All members should keep Dr. Perry informed of changes of address.

Drafting members should name their subject or subjects at the time of paying their subscriptions. They will then receive detailed marching orders and suggestions—which, of course, they will be fully at liberty to disregard. In general, we will ask them to pursue the scientific method of collecting evidence and basing their conclusions upon it. In this connexion we can recommend the P E P report of 1937, or in shorter form the summary by S. Mervyn Herbert, *Britain's Health* (Pelican, 6d.).

The subdivisions of our problem which we propose, and from which we invite our drafting members to take their pick, are as follows:

General Problems

The Medical Needs of the Population.—The post-war population—the distribution of the population—the population's needs in terms of doctors (general practitioners, consultants, specialists, research workers, public health workers), dentists, nurses, almoners and social workers, clinics, hospital beds, environmental services, nutritional services.

The Capacity of the Population to Pay for its Needs.—The national income—the proportion spent on the health services—how it is collected—how it is spent—the individual capacity to pay. The proportions of the population in different income groups. Family budgets.

How should the Population Pay?—The patient's point of view: cash payment, insurance, rates, taxes. The doctor's point of view, fees, capitation fees, salaries for G.P.s, consultants and specialists, hospital staff, public health workers. Grading of patients on capacity to pay.

How should the Population be Served?—General practitioners—free choice of doctor—clinics—health centres—small hospitals—large hospitals—hospital groups.

How should the Services be Distributed?—Chance—tradition—planning—local authorities—regional authorities.

Administration.—The need for individual autonomy—the need for local autonomy—team work—the firm in general practice—the firm in hospital—medical and lay administrators. Committees: advisory and executive—small and large, medical and lay. Authorities: local, regional, national. Forms and red tape.

Special Problems

The Hospital Services.—Regionalization—unification of control—unification of finance—regional hospital authorities—national hospital authorities—size of hospitals—nursing homes—dispensaries—hospital groups—town or country hospitals—design of hospitals—preservation of traditional features (names of hospitals wards, etc.)—special hospitals, as part of hospital groups, as national specialist centres of teaching and research—out-patient services—appointments for out-patients—clinics—emergency services—the non-urgent patient; waiting lists—ambulance services—medical superintendent or firms and units—resident medical officers and resident surgical officers—medical or lay administrators—hospital committees, lay, medical—internal administration of hospitals—consultant and specialist services, in hospital, in the home; "consultoids," "Harley Street"—the "private patient"—medical staff, part-time, whole-time—resident medical staff—continuity of treatment—hospital records—clerical assistance for medical staff.

The Specialist Services.—The apportioning of beds according to the needs of the patients—need for flexibility within hospital services according to changing needs of the population—general medicine—general physicians or special physicians—diseases of the chest—tuberculosis services: tuberculosis officers; sanatoria; Papworth; the employment of the tuberculous in sanatoria—cardiology; cardiac invalidism—gastro-enterology—biochemical medicine—neuropsychiatric services, neurology, psychiatry, psychotherapy, occupational therapy, child psychiatry and child guidance, institutional treatment, neuropsychiatric clinics, mental hospitals, institutions for defectives, epileptic colonies, prisons and criminal psychopathic hospitals, the case for a combined service with periods of work in each type of institution, the psychopath at large—arthritic services, physiotherapy, hydrotherapy, spas—fever services—paediatric services—school medical services—venereal services—dermatological services—tropical diseases—convalescence—rehabilitation—the chronic sick—general surgery—general surgeons or special surgeons — anaesthesia — cancer service — traumatic surgery, fracture services—burns—orthopaedics—care of the crippled and permanently incapacitated—plastic surgery—massage and physiotherapy—pulmonary surgery—cardiac surgery—abdominal surgery—genito-urinary surgery—cranial surgery—ear, nose, and throat surgery; tonsils and adenoids; the deaf and dumb — ophthalmology; spectacles; opticians; the blind — gynaecology—midwifery: institutional; domiciliary; the midwife—maternity and child welfare services—abortion—birth control—sterilization—euthanasia—eugenics—radiology, who should interpret x rays?—radiotherapy, radium, radiographers—pathology, bacteriology, biochemistry, clinical pathology, laboratory technicians, transfusion services—dentistry, as a part of a national health service, internal problems—pharmaceutics, dispensers, cash chemists, manufacturing chemists, patent medicines.

Medical Education.—The supply of students—cost of medical training—pre-clinical studies—clinical studies—social studies—environmental studies—apprenticeship in practice—examinations, multiplicity, bookishness, cramming—postgraduate training—refresher courses—foreign travel—mixed and unisexual medical schools—university hospitals—research—the film in medical education.

General Practice.—Single-handed or firm—the locum—the assistant—sale of practices—pensions for G.P.s—scope of general practice—need for consultants—pathology in general practice—G.P. specialists—G.P.s and hospitals—the panel and its extension—number of patients per doctor—certificates—dispensing—the panel from the patient's point of view; sickness benefit, additional benefits, approved societies—contract practice—clubs—workmen's compensation—domestic help for the sick—should the G.P.s run the clinics?—co-ordination of G.P.s panel committees, regional medical officers—special war problems, shelter doctors, evacuees.

The Environmental Health Services.—Local authorities or regional authorities—duties of the M.O.H.—size of M.O.H.'s area—sanitation: rural problems; water supply; refuse disposal—food, protection, nutrition, school meals—epidemiology—vital statistics—port health authorities—industrial medicine—hours of work—holidays—unemployment and health—health education—physical education—medico-legal services, coroners, medical witnesses, medical assessors, need for an institute of forensic medicine.

Medicine and the Defence Services.—R.N. Medical Service—R.A.M.C.—R.A.F. Medical Service—Ministry of Pensions Medical Service—I.M.S.—Colonial medical services—Merchant Naval medical services—the case for a combined service with periodical work in each.

The Nursing Services.—Recruitment—training—payment—pensions—domiciliary nursing, the district nurse, the private nurse—health visitors—specialized nursing, fevers, tuberculosis, the chronic sick, mental nursing, midwives, industrial nurses—seasonal features of nursing, need for a pool of nurses—the male nurse.

The Almoner and Social Services.—Recruitment—training—payment—pensions—scope of work—specialized social work, mental health, family visiting, social research.

Miscellaneous Problems.—The Emergency Medical Service—the State's liability in war—ancillary medical services: opticians; masseurs; chiropodists; laboratory technicians, etc.—special problems of medical research, "pure" research, clinical research, social research, attempts to combine teaching, administration, and research—health services in other countries—medical missions—Highlands and Islands medical service—Gloucestershire medical services—Nuffield Provincial Hospitals Trust—Pioneer Health Centre, Peckham.

The list is a formidable one. With its fifteen main headings and some 320 subject headings, we hope that it is fairly comprehensive. Experience may show that it needs revision, and we are ready to admit errors of omission or commission. There has inevitably been a small amount of overlapping, where the same matter requires consideration from more than one aspect. The list illustrates the size and complexity of the problems which have to be studied; as a corollary it illustrates how essential it is that planning for the future should be done as a large-scale co-operative research rather than as a series of isolated efforts.

It is, of course, open to a drafting member to choose a main heading, or several subject headings. Even if each drafting member undertakes a wide subject or range of subjects, we shall need a large number of such members. If any drafting members also wish to undertake the work of assessing collating

and subediting reports, they should indicate this when writing to Dr. Perry.

The signatories of this letter were recruited solely by personal contact. They make no claims to represent the whole profession, and, while they are drawn from as wide a circle as has been possible, there are necessarily many gaps to be filled. They profess no sectional interests.

We are, Sir,

Sidney Abrahams	L. A. Hawkins	Kenneth M. A. Perry
Stanley Alcock	W. H. Hayes	G. White Phillips
Stanley Alstead	Alastair Hunter	Hugh Ramsay
G. O. Barber	Donald Hunter	A. H. T. Robb-Smith
R. H. R. Belsey	Margaret N. Jackson	Alan F. Shirras
Frank Bodman	V. M. S. King	A. H. M. Siddons
R. E. Bonham-Carter	W. N. Leak	Charity Taylor
E. J. R. Burrough	C. G. Learoyd	Stephen Taylor
W. I. Card	A. David Le Vay	W. A. R. Thomson
George Day	Duncan G. Leys	Doris M. Thornton
Richard H. Dobbs	A. Macdonald	R. E. Tunbridge
S. C. Dyke	H. H. MacWilliam	J. Michael Vaizey
J. A. Fathi	D. McGavin	H. J. Voss
A. F. Foster-Carter	Andrew Morland	Philip Wiles
A. S. Hall	Gerald Parsons-Smith	Clifford Wilson
J. R. G. Harris	J. E. G. Pearson	Henry Wilson

FIRST AID IN AIR RAIDS

EXPERIENCES OF BRISTOL PRACTITIONERS

A very largely attended meeting of the Bristol Division of the British Medical Association was held at the University on June 12, when there was a symposium on "Experiences of First Aid in Air Raids." Dr. J. A. NIXON, chairman of the Division, presided.

Mobile Units

Dr. H. M. GOLDING said that when the sirens first howled in Bristol last year and were followed by bomb explosions the doctors at his post collected with commendable rapidity and presently came back with exciting stories. It was commonplace enough now, though to the speaker the most fearsome part was still the drive alone from home to the post in the middle of a "blitz." In Bristol it had been the policy to place first-aid posts at established clinics or hospitals, thereby ensuring a fully equipped staff. Although he was on the mobile unit he had had a good deal of experience of post work, waiting up all night for casualties which never came, and on other occasions having the post full to overflowing. Shock had been encountered in all its forms, and they had learned that its degree did not depend on the severity of the injury. A patient with a scratch might be profoundly shocked; on the other hand, a man who had been trapped under falling debris was brought in with ruptured patella and forward dislocation of the knee-joint and showed practically no shock at all, although to his injury was added uncertainty as to the fate of his family. On the human side a great deal had been learned. Patients were no longer asked to go home before it had been ascertained that there was a home for them to go to.

The mobile unit was a van fully equipped to set up an emergency first-aid post near the scene of severe "incidents." Unfortunately it had not worked quite so easily. Either there was no suitable accommodation just where it was needed or the building chosen was not blacked out or the black-out had been blasted away. The mobile unit, sent out on orders from the report centre, was manned by a doctor, a trained sister, five auxiliary nurses, and a driver. His own unit had belied its name by remaining completely immobile for many months. The first "incident" attended was a quarter of a mile from any suitable building in which the post could be set up, and the casualties had been collected in a large surface shelter. The casualties varied from a sprained ankle to a depressed fracture of the skull, and they had to be treated under most difficult conditions. It was a great relief to see them taken away in the ambulance.

"In the prevention of shock immediately after injury one was told to ensure freedom from worry, and I had an interesting lesson about that. A woman was completely buried in debris. When her head and shoulders were exposed she cried, 'I have lost my handbag.' A man who was standing by said, 'It's all right, missis, the policeman's got it.' Actually the handbag was not dug out of the ruins until some four days later, but the woman had been most effectively treated for shock."

Dr. Golding concluded with a special tribute to the sisters and nurses of his unit, who had turned out in the most hazardous conditions without hesitation, and to the police, ambulance, and rescue parties, the co-operation between whom had been all that could be desired.

Control of the Air-raid Services

Dr. A. M. FRASER (Assistant M.O.H., Bristol) said that his experience had been in the control, where it was his business to help the divisional report centres in the operation of the casualty services. These centres controlled the ambulance, first-aid, and rescue parties for the division, which also had at least one first-aid post, one mobile unit, a blister-gas cleansing station, and an emergency mortuary. All these were co-ordinated by the officer in charge. Reports from the wardens were passed to the central control, which was able to supply more help where it was needed. The chief value of reinforcements from outside was not during the first raid night, but on the following night should the attack be repeated. A second important job was to keep in touch with the hospitals. If the control discovered that one hospital was receiving a heavy load while others were not receiving casualties, instructions were sent to the report centres to deflect ambulances accordingly to places where surgeons and beds were waiting.

Dr. M. E. J. PACKER said that he had had the privilege of turning out for every raid, and had learned useful lessons at each. On the first occasion, when a factory was "blitzed," the first-aid unit was called out rather late, and by the time it arrived most of the casualties had been cleared away. He described certain experiences which showed how necessary it was for the doctor attending an "incident" to have emergency equipment with him. He now adopted the plan of having a ready-packed bag to be taken wherever needed. Any unwanted first-aid vans and personnel should be cleared as quickly as possible from the vicinity of an "incident," where another explosion might very well occur, with disastrous effects. One of the disadvantages of distributing patients in near-by houses in the care of nurses where they might receive dressings and injections was that these houses were very likely to be deprived of light, and he thought it was important to provide facilities for the antitetanic serum injections to be given in the van itself to obviate unnecessary journeys to the first-aid post. Afterwards, instead of taking the rather cumbersome van to the different points, he left it as a kind of headquarters at the main crater and himself went round with nurses in a small private car, which turned more easily. Dr. Packer mentioned also the greater safety of wriggling through narrow holes rather than large, because the overhanging debris was not so likely to collapse; also the danger of the steel helmet knocking against a lot of loose stuff and precipitating a fall. The doctor should be accompanied by several nurses, who might be left at different points, and thus he and they could keep in touch with all the "incidents" at the same time.

The Casualty Doctor's Equipment

Dr. J. MORTON EVANS, jun., said that his main difficulty in charge of a mobile unit was in getting from the post to the casualty. He took three things in his pocket—a torch, a hypodermic outfit in a spirit case, and a rubber-capped bottle filled with a solution of morphine, 1/2 gr. per c.cm. It was impossible to get sterile water at the scene of an "incident," but even in the dark one could push the hypodermic needle through the cap and fill the syringe. To give some outside protection to clothes when crawling over debris he customarily wore a muffler, an overcoat, an old pair of golf trousers, and gauntlet gloves. Of 250 casualties he had attended just over one-half had been eye injuries or burns. Many of these were firemen who, if not actually burned, had smoke in their eyes to such an extent that for a time they were completely blinded. Washing their eyes out and putting in liquid paraffin gave them great relief. Of the rest, 7.5% of the casualties were burns to the hands or limbs; 10% head injuries, 27% wounds of the limbs, 1.5% wounds of the trunk, and 3% shock or blast injuries. Of this number probably 10% were sent to hospital.

Dr. R. J. STEPHEN spoke also of the large number of burns affecting the eyes. He had felt the need for some anaesthetic solution for treating damaged eyes. The usual procedure was to wash with an alkaline solution and put in liquid paraffin. One of the difficulties in treating casualties on the spot was the cutting off of water and electric supplies. Spare water was carried in the first-aid van, but it soon became a bowl of mud.

Dr. W. H. HAYES said that he was not attached to the official organization, but had gone to "incidents" near him. He hoped that the scheme for calling upon doctors nearest to the occurrence would soon be completed so that they would be called out instead of going out on their own. On the question of administration of morphine, it was useless "fiddling about" with ampoules. He thought doctors should be supplied with something similar to army field dressings which could be put straight on and bandaged round.

Dr. H. D. PYKE said that there were occasions when he felt that he had done nothing beyond giving moral support, yet were he a victim he would like to feel that there was a doctor handy and that he had equipment ready for use.

Dr. I. G. DAVIES (Deputy M.O.H., Bristol) said that experience had shown that the doctor must be completely mobile, with possibly a nurse, and very light emergency equipment. Nobody appeared to have predicted that casualties would have to be dug out of buildings amid indescribable dirt and dust. First-aid and rescue parties had to learn how to dig people out of wreckage without adding to their injuries.

Dr. N. S. B. VINTER said that in his district outside Bristol a roster of doctors had been drawn up for call as needed. The presence of a doctor was of great help to the first-aid party.

Mobile Units

Colonel E. T. POTTS (Ministry of Health) said that mobile units were originally intended for work in rural areas, not in cities, but experience had shown that they could be of great value in urban localities. It was useless to call them out, however, to small "incidents" of three or four casualties. It was possible to have a roster of doctors who would be prepared to go to "incidents" scattered over a considerable area, so that there would always be medical help available wherever the need arose. A scheme of that character had been developed in South Wales and in other places whereby a warden summoned the doctor direct and advised the control that he had done so. Morphine was originally issued in the form of tablets, but the difficulty of dissolving the tablets in the dark had been brought to the Ministry's attention, and it had now been arranged that first-aid posts and mobile units should be issued with morphine in solution in rubber-capped bottles. Among the casualties the large proportion of injuries to head and face was noticeable all over the country; next came wounds of the upper extremity, followed by wounds of the lower. Burns had increased appreciably since the widespread use of incendiary bombs. Cases of shock were decreasing notwithstanding the greater intensity of air raids.

Dr. TREVOR JONES (Cardiff) said that Cardiff had taken all doctors in active practice who were willing to do the work and had attached them to wardens' posts. The doctors were those who lived near the posts and knew the wardens personally. When an "incident" occurred the wardens sent immediately for the doctors, who were equipped with a bag containing the requisites mentioned, most notably morphine solution and a syringe. Control was notified directly the doctor was called out, and thus knew where each doctor was. There were not enough doctors to go round, and sometimes a doctor was attached to more than one wardens' post. Senior medical students were also available.

Before this very successful meeting ended it was agreed to hold on July 10 a similar symposium on the casualty services for air-raid victims in hospitals.

As a result of representations made by the British Hospitals Association, and pending the conclusion also of definitive arrangements, supplies of rationed goods to voluntary hospitals and other hospitals not covered by existing arrangements may be made by traders without coupons against a receipt of the same type as that provided in the case of supplies to local authorities.

CENTRES FOR TREATMENT OF FRACTURES

Further centres for the treatment of fractures are to be set up under the Emergency Hospital Scheme in addition to the twenty special Orthopaedic Centres already established. The latter are not able to deal with all types of fracture cases as well as the special orthopaedic cases for which they were designed; and, with the extension of fracture treatment under the Scheme to industrial workers and members of the Civil Defence Services, it has become necessary to arrange facilities at a large number of additional hospitals. The new centres will be grouped as follows:

(1) Fracture Departments "A" in hospitals suitable from their situation for cases requiring treatment over a long period. These departments, which will normally be able to accommodate 100 to 150 patients, will be under the direction of a surgeon experienced in the treatment of fractures, will provide for proper segregation of cases, and will have facilities for massage, electrotherapy, remedial exercises, and occupational therapy.

(2) Fracture Departments "B" in hospitals with the necessary medical staff, experience, and equipment for the treatment of fractures but suitable only for ambulant cases and those not requiring more than about a week's in-patient treatment.

(3) Fracture Clinics "C" within reach of the patient's home for out-patient treatment after discharge from hospital. Arrangements are being made to recognize certain clinics for this purpose, and as soon as these are settled details will be sent to hospital authorities.

This information is given in a Ministry of Health circular (No. 2395) which has been sent to local and hospital authorities and in some instances to medical officers of health and is accompanied by a list of the Orthopaedic Centres and the hospitals which have been selected as Fracture Departments A and B. Instructions are being issued as to the types of cases which should be transferred to Orthopaedic Centres and to the various fracture departments and, for the benefit of the latter, information concerning personnel, accommodation, and equipment.

INTER RELATION OF MAN AND FUNGUS IN HEALTH AND DISEASE

A Chadwick Lecture on this subject was given on June 19 at the Chelsea Physic Garden, S.W., by Mr. J. Ramsbottom, D.Sc., with Sir William J. Collins, M.D., in the chair. The lecturer began by recalling that the outstanding characteristic of fungi was that they had no green colouring matter—chlorophyll—and were unable to form their own carbohydrates from the carbon dioxide of the air and water as did green plants. They must therefore have organic food already elaborated and thus must live a parasitic or a saprophytic existence. Apart from the use of some of the larger fungi as food and the poisonous properties of a few of them there were many ways in which fungi affected the welfare of man. He himself might be parasitized by ringworm fungi of various kinds or by more obscure but more virulent forms; his ox and his ass might likewise suffer from similar diseases. Fungi levied a constant and sometimes disastrous toll on his crops, and the fruit he grew was rarely without spot or blemish unless precaution was taken against attack. The larger fungi often killed forest trees, or produced a "wet rot" which would cause structural defects if the timber was used haphazard. Moreover, all fallen logs, leaves, herbs, grasses, and other organic material were gradually removed by fungi. Without saprophytic organisms acting in this way the surface of the earth would soon become so covered with remains that seedlings would be unable to take root or obtain food, and vegetation—and life as we knew it—would end. But if man wished to preserve anything organic for his own use he must wage constant war against fungi. If his buildings were not kept dry and well ventilated the woodwork was almost invariably attacked by the dreaded dry-rot fungus, *Merulius lacrimans*. His stored food must be dry, or sterilized, or kept at a low temperature, otherwise it would rot and putrefy. But all fungal action was not to man's disadvantage. Every nation had its fermented liquors; yeasts raised the dough in breadmaking; moulds ripened cheese. Modern practice was to control the age-long methods, for otherwise there might result products other than those traditionally

anticipated. Man, moreover, was beginning to harness fungi to carry out processes according to his wish. Taka diastase, used so much in medicine, was produced by the same fungus which fermented soy sauce, the basis of all table sauces. In spite of Italy's being at war there was abundant citric acid, for it was easier to produce this by mould fermentation than to extract it from lemons. Just as man depends on green plants for his existence and developed them for his enjoyment so he depends equally on saprophytic fungi and was using them in increasing measure for his benefit.

HOSPITALS AND GAS CASUALTIES

NOTES ON RECEPTION AND MANAGEMENT

Should the enemy employ gas the medical services would inevitably be heavily taxed and the hospitals would be confronted with a number of new problems, both clinical and administrative. Some of these must remain unforeseen. For others, past experience and various sources of information provide a solution. As with bombing, so with gassing: modifications of plan and method in respect of the collection, transport, hospital treatment, and evacuation of casualties would evolve from experience derived in new situations. In the meantime it must be considered urgently necessary to establish in every suitable hospital in the country a state of preparedness for such contingencies as can at present be anticipated. Such preparedness demands thought and action and training, but need not involve any undue elaboration or expenditure. Much information and much instruction have already been issued on decontamination and the treatment of the individual case. Outside the hospitals training and preparation should by now be well advanced. The present notes relate to organization within the hospital.

Medical Officers in Charge of Gas Casualties

In every hospital capable of receiving casualties there should be at least one physician whose duty it would be to take charge of the reception, sorting, and care of gas cases. From the available manuals and other literature, and attendance at lectures or courses, he should make himself acquainted with the essentials of diagnosis and treatment. He should hold himself responsible for the instruction of house officers, sisters, nurses, and orderlies, and, in the teaching hospitals, of students, in the methods of treatment advocated for casualties due both to the vesicant and to the pulmonary irritant gases; where staff is short the co-operation of dental surgeons for assistance with oxygen therapy and apparatus could also be sought. In conjunction with the medical superintendent or medical officer in charge, he should ensure the arrangement and equipment of the hospital decontamination centre. He should personally supervise the training of a decontamination unit (male and female). In conjunction with the medical superintendent or medical officer in charge he should acquaint himself with the storage, source, and reserve sources of supply of oxygen cylinders. He should procure or improvise* sets of apparatus for the distribution of oxygen from one cylinder to several patients. He should ensure that all those likely to be concerned understand the use of the nasal catheter, the B.L.B. mask, the spectacle-frame outfit, and fine-adjustment valves and flowmeters, and that there is a sufficient supply of all of these and of rubber connexion tubing and glass connexions.

Organization

As with wounds, so with gas casualties: "reception and management" may be held to cover decisions in relation to (a) the initial reception and sorting of cases; (b) the grouping or separation of cases into categories for special treatments: (c) the disposal of cases, including suitability and optimum time for transportation elsewhere of special types of case. Such decisions clearly require different consideration and arrangements in the case of vesicant and pulmonary irritant casualties.

* A note on inexpensive improvised distribution will be issued later.

Reception and Management of Casualties due to Vesicant Gases

Although every hospital should have its decontamination centre and a trained decontamination unit it should not, given good co-operation on the part of the public, the A.R.P. services, the first-aid posts and cleansing centres, be called upon to deal with the generality of mildly or moderately contaminated cases. It should, however, expect to handle (a) severely contaminated cases (liquid) or persons who have been recently contaminated (liquid or vapour) when without gas-mask or otherwise inadequately protected; (b) cases of simultaneous wounding and gassing; (c) its own personnel who have been exposed in or in the neighbourhood of the hospital. Of such cases, once decontaminated and in receipt of initial treatment for skin and eyes, it should be possible (when necessary) to evacuate the majority as stretcher or sitting cases forthwith or at an early date, excepting only those whose associated wounds are of such severity as to preclude movement.

During the hours or days following a local gas attack it is probable that cases other than those in the above categories would begin to arrive for treatment of developed lesions. Minor skin and eye cases could be treated as out-patients or, if desirable on other grounds, evacuated. Admission might be necessary for cases of severe or extensive skin lesions, for which a good supply of cradles is necessary. Again, however, the evacuation of most of these, excepting the more severe broncho-pulmonary cases, should generally be justifiable. Cases in the above categories would be in a stage past that in which further decontamination by washing would be necessary or, in fact, of any value. In the case of persons recently gassed and suffering from wounds and wound shock, decontamination should not go beyond careful undressing with free use of scissors, attention to exposed parts, initial treatment of the eyes, and cropping of hair if liquid contamination is suspected. Once undressed and so treated, patients would no longer present any dangers to those working in the operating theatres or to other patients or personnel in a ward.

Casualties due to Pulmonary Irritant Gases

Phosgene casualties on or soon after arrival may be conveniently sorted into (a) mild, (b) moderate, and (c) severe categories. The "mild" cases (perhaps 50% or more of the admissions) may present with such symptoms as cough and tightness or pain in the chest, but with good colour, the pulse rate and quality not greatly or at all disturbed, little or no dyspnoea, no cyanosis, and no physical signs of pulmonary oedema. Such cases should be treated in a separate ward or, if the weather permits and war conditions are no contraindication, in tents or marquees, on balconies, or otherwise in the open. They can be nursed on stretchers if beds are not available. They should not be allowed to exert themselves or to get up; they may be given fluid nourishment as required and mild sedatives.

The "moderate" cases will show the same symptoms in more severe degree, with the addition of more "tightness in the chest," dyspnoea, and perhaps slight forms of cyanosis. They can be similarly treated, and may be further benefited by the administration, for a few minutes at a time every quarter of an hour, of pure oxygen from an ordinary nitrous oxide bag with small, easily movable cylinders. In this way one nurse or orderly can take charge of some dozen cases. Once a sufficient improvement is manifest, oxygen therapy can be discontinued. Should any case, on the other hand, deteriorate in spite of these measures, continuous oxygen therapy must be immediately instituted.

The "severe" cases (perhaps 20% or less of the admissions) show urgent dyspnoea. Blue or grey cyanosis may be present or appear, often with auscultatory signs of pulmonary oedema or with actual expulsion of froth from mouth or nose. There may be collapse, with feeble pulse, low blood pressure, and cold extremities. The cases should be treated from the first with continuous oxygen given in sufficient quantity to maintain a pink colour. It may be necessary to continue the treatment for twenty-four, forty-eight, or even seventy-two hours. The closest watch must be kept on such cases and on the efficiency of the cylinders and oxygen-feeding apparatus. It may be necessary to raise the feet and lower the head to facilitate the escape of oedema fluid. Ideally, no patient who

is known to have been exposed to phosgene gas or who presents indisputable symptoms should be evacuated to a distance or otherwise than as a stretcher case for a period of forty-eight hours. Exertion may bring on serious symptoms in a patient previously but little affected. No case requiring continuous oxygen is likely to be fit for evacuation in under a week. Absolute rest, fresh air, oxygen, posture, adequate fluids, and good nursing are the essentials of treatment. The segregation of the severe from the mild cases is important from the psychological point of view as well as to ensure effective supervision and treatment.

There should be a weekly "drill" in reception, decontamination, and oxygen therapy, employing personnel as "patients."

All hospital personnel should be instructed to keep their gas-masks near their place of work. On one day in each week all personnel should wear and work in their gas-masks for a quarter of an hour. They should also carry A.G. No. 2 ointment with their masks.

AWARD FOR GALLANTRY IN CIVIL DEFENCE

The award of the George Medal to Dr. LAURA BATEMAN, medical officer, Brook Hospital, Shooter's Hill, is announced in a *Supplement* to the *London Gazette* dated June 13.

The announcement reads as follows: "When the Brook Hospital was bombed two maids were imprisoned by debris. Dr. Bateman quickly relieved the suffering of the first maid, but the other was buried under girders and masonry. Dr. Bateman volunteered to crawl under the wreckage and administer an anaesthetic. A porter held her, suspended by her ankles, while she reached the casualty and successfully carried out the injection. A slight subsidence might have resulted in her being trapped and fatally crushed. The danger was very apparent, but this did not deter Dr. Bateman from carrying out a gallant and difficult action."

ROCKEFELLER MEDICAL STUDENTSHIPS

In the *Journal* of March 15 (p. 409) we announced the facilities generously offered by the Rockefeller Foundation for British medical students to pursue clinical studies in medical schools in the United States and Canada. The composition was given of the British committee formed (with Sir John Stopford as chairman) to select between twenty and thirty students from among those nominated by the deans of medical schools in this country. Nearly a hundred applications were received and about two-thirds of the candidates were interviewed. The following are the names of those chosen by the selection committee for Rockefeller medical studentships. These twenty-six students are being sent to nineteen universities in the U.S.A. and Canada.

Name	*University Medical School*
BADENOCH, J.	Oxford
BARTLEY, C. W.	London Hospital
CADMAN, E. F. B.	Liverpool
DAVIES, J.	Leeds
EDWARDS, D. A. W.	Cambridge
FLOYER, M. A.	Cambridge
GIBSON, J. B.	Edinburgh
GOSLING, R. H.	Birmingham
GRAY, I. R.	University College, London, Faculty of Medical Sciences
HARE, P. J.	University College, London, Faculty of Medical Sciences
MAY, P. R. A.	Cambridge
NEWTON, M.	Cambridge
O'HEA, M. A.	Glasgow
POND, D. A.	Cambridge
RANKINE, G.	St. Andrews
SCOTHORNE, R. J.	Leeds
SHARP, J.	Manchester
SHEPHARD, R. H.	University College, London, Faculty of Medical Sciences
SHEPHEARD, J. V.	Liverpool
SHILLINGFORD, J. P.	London Hospital
STEPHENS, J. D.	St. Andrews
STOWERS, J. M.	Cambridge
SWYER, G. I. M.	Oxford
TANNER, J. M.	St. Mary's Hospital
TODD, I. P.	St. Bartholomew's Hospital
TURNER, R. G.	Cambridge

Reports of Societies

DERMATOLOGY IN MILITARY PRACTICE

In an address delivered to the North of England Branch of the British Medical Association at Newcastle-upon-Tyne Major R. M. B. MACKENNA, Command Specialist in Dermatology, Northern Command, discussed a number of points in practical dermatology which had arisen in his Army experience.

Major MacKenna said that a reference to the Official History (1923) of the last war showed that, with the exception of pediculosis corporis, the cutaneous diseases which then caused most absence from duty were those most prevalent in the Home Army to-day. Scabies with its septic complications, infected (impetiginized) seborrhoeic eczema, impetigo contagiosa, ecthyma, and furunculosis all had a high incidence in the last war and had engaged attention during the present one; but the group of diseases classified as "inflammation of connective tissue," including abscesses, boils, pyodermia, and the like, had not been so prevalent as in peacetime. The incidence of diseases such as moniliasis and plantar warts had been low.

Treatment of Scabies

In the 102nd Field Ambulance during the last war scabies was treated by means of a solution of sodium thiosulphate and a dilute mineral acid. In recent years this routine had been popularized by Wernick in Germany and Huber in Hungary. It had the advantages of therapeutic efficiency, rapidity of action, and cheapness. After a bath or a wash with hot water a 40% aqueous solution of sodium thiosulphate was applied to the patient, from the neck to the feet, with careful attention to the flexures and the webs between the fingers. The solution having dried, the patient was then swabbed or sprayed with a 5% aqueous solution of hydrochloric acid. A whitish precipitate of sulphur and salt appeared on the skin, which was allowed to dry, and the process was repeated. When the second application of acid had completely dried, the patient put on clean clothing, his former clothing meanwhile being disinfected. The whole process was repeated on the following day. This routine was not advisable with children on account of the coughing and discomfort caused by the liberation of sulphur dioxide.

Another good treatment was Nielsen's ambulatory method. During a hot bath the patient was cleansed thoroughly with soft soap, and while still wet his body and limbs were painted with the following solution, applied with a brush:

℞ Isopropyl alcohol, Benzyl benzoate, Soft soap } aā partes aequales.

When the solution had dried a second application was made, and twenty-four hours later the patient had a cleansing bath.

These were two modern methods of treating scabies, but Major MacKenna had found Marcussen's ointment satisfactory when properly prepared and used with discretion. Two quick baths were given each day. After the second bath, in the afternoon, the ointment was applied from neck to feet. By this technique the incidence of sulphur dermatitis was kept low. The average number of days on which the ointment was applied in 100 consecutive uncomplicated cases was 3.7. There was a similarity between the reaction to sulphur and to ultra-violet rays. The red-haired subject invariably developed sulphur dermatitis after a minimal exposure to sulphur; the brown-haired blonde was more immune, and sulphur dermatitis very seldom developed in the brunette.

Ecthyma

Ecthyma, which was uncommon in civilian practice, gave rise to a good deal of prolonged invalidism during the last war. It usually developed as a complication of scabies or pediculosis corporis, and had been defined as a deep or dermic impetigo, differing only in degree from impetigo contagiosa. These cases had caused him some anxiety in military practice because of their very slow response to treatment. Hot fomentations, kaolin poultices, acriflavine emulsion, eusol compresses, perchloride of mercury lotion, iodine, and starch paste had all been tried, but the ulcers were indolent and intractable. Then he recalled that many authorities believed the condition to be streptococcal in origin, and he tried the effect of giving sulphanilamide or sulphapyridine by mouth, but the response was disappointing. Finally he tried the effect of crushing a tablet of sulphapyridine to fine powder, pouring this into the ulcer, and sealing it in place by means

of a piece of gauze or lint thickly smeared with Lassar's paste. He found this to be a very successful line of treatment, to which few cases of ecthyma failed to respond. The same treatment was quite useful in impetigo contagiosa, particularly in those cases in which the oozing was not too copious; and it was also a very satisfactory treatment of chancroid. It was interesting to find that better results were obtained by the crude method of crushing sulphapyridine tablets to fine powder and using this as a local application than by using powdered sulphanilamide.

Major MacKenna also described a case of chronic meningococcal septicaemia—a condition to which there was a brief reference in the *Medical History of the War* of 1914-18, but which seemed to have been forgotten, except by a few authorities, during the last twenty years. He had come across one case, which seemed to be an almost classical example, in a young officer who had had a sudden rigor followed by a rise of temperature; the fever subsided after a few days, but was followed some weeks later by another rigor, necessitating admission to hospital. For two days he had an intermittent temperature rising to 103°, but beyond this there were no definite symptoms or signs. After ten days, during which clinical investigation was made and no reason for the pyrexia was found, he returned to duty, but had another rigor, and came back to hospital with an intermittent pyrexia which lasted for three days. On investigation the only finding of significance was a leucocytosis of 10,000 cells per c.mm., without alteration of the relative proportions of the leucocytes. A further rigor was associated with the development of reddish nodules on the limbs, swelling in the elbow-joint, and pains in the knee. A blood culture was taken during a period of pyrexia, and meningococci were isolated. In a second case meningococci were again cultured from the blood stream. Each case cleared up under intensive dosage with sulphapyridine (a total amount of about 30 grammes being given), although in the first case, small doses of sulphapyridine had been administered when the patient first came into hospital, but had not cured the disease.

Major MacKenna continued his address with some remarks on sulphapyridine in the treatment of gonorrhoea—a full account of which will be found at page 958 of this issue.

SAFETY IN SURGICAL TREATMENT OF RECTAL CANCER

At a meeting of the Section of Proctology of the Royal Society of Medicine on June 11, with Mr. W. B. GABRIEL in the chair, a discussion took place on the factors which make for safety in the pre-operative and post-operative treatment of carcinoma of the rectum.

Prof. E. R. FLINT founded his opening remarks on 86 cases in all of which colostomy was done, but in only 49 subsequent excision of the rectum, giving a proportion of 58% in which he thought excision was justified. Unless surgeons were engaged in special hospitals for dealing with these conditions their operative experience was not likely to be large, therefore the surgical methods in use should be standardized so far as possible from the point of view of the safety of the patient. The excision in all these cases was done according to Kraske's method, which he thought to be safer generally than the abdomino-perineal, except in the hands of surgeons of great experience. Unless there was acute obstruction, patients with carcinoma of the rectum were not extremely bad risks. Nevertheless, operation was a tax upon them, and two pre-operative measures advisable were colostomy and blood transfusion. When faeces were diverted from the affected part, excision was rendered much safer in that the virulence of organisms in the neighbourhood was greatly diminished and the rectum could be cleaned. There was no doubt that after a colostomy had been carried out and given time to function properly the condition of the patient was immensely improved. Blood transfusion was customarily given the day before the operation and if necessary was continued at the time of operation and afterwards. Infection might occur when the gut was cut across, or it might take place subsequently in the form of cystitis. To avoid infection of the wound he divided the colon between clamps, burnt the end which was left, and infolded it in the same way as with a duodenal stump in gastrectomy, taking care that the cut end did not come in contact with the wound. At the end of the operation he put in a three-way Carrel tube through which Dakin solution was syringed, and gauze soaked in Dakin lightly laid against the whole surface. The same purpose might perhaps be served by powdering the surface with a sulphonamide compound. To avoid cystitis, which might be fatal, he irrigated the bladder by the continuous method. Apart from the continued irrigation through the Carrel tube and the continued irrigation of the bladder there was not very much necessity to do anything further

Pre-operative Considerations

Surgeon Rear-Admiral GORDON-TAYLOR said that one of the most important pre-operative measures was an early decision by the surgeon as to the type of operation he proposed for the particular patient. The surgery of cancer was surgery of the lymphatic system, and for many patients the "combined" operation would carry a heavy mortality. The next pre-operative measure of importance was that the surgeon should be skilled, experienced, and judicious. He would consider the age, sex and race of the patient, also the cardio-vascular, nervous, and urinary systems; pulse pressure would also need consideration as indicative of the type of operation to be performed. Any surgeon of experience would beware of the patient who was extremely apprehensive, also of the one who "changed his religion the night before the operation, or who kept the theatre waiting while he finished his autobiography." Age offered no barrier: most surgeons would have performed excision successfully in patients over seventy. Women stood the "combined" operation better than men. Some races were a bad risk. There was no doubt that preliminary drainage helped enormously.

Dr. CUTHBERT DUKES indicated certain ways in which the pathologist could help. It had been the practice at St. Mark's to carry out a routine biopsy in all cases, and this often afforded important information as to both the growth and the ability of the patients to stand the operation. Of chief importance was the recognition of anaemia and of defective renal function. The pathologist could also be of assistance in post-operative complications.

Mr. NAUNTON MORGAN said that the control of pre- and post-operative fluid balance was essential, and in a major operation it was necessary to give an additional 500 to 1,000 c.cm. of fluid. A large amount might be lost by vomiting and must be replaced. The giving of fluid by the mouth might be dangerous, and after excision of the rectum fluids should be given by the intravenous route. Bowel activity might be encouraged by the use of small enemata after flatus or faeces were passed; large enemata should not be given, as distension might cause kinking. Everyone would agree that routine blood transfusion had reduced the mortality rate.

The Anaesthetist's Part

Dr. T. FRANKIS EVANS spoke of the anaesthesia in such cases. He would first see the patient, learn his temperament, gain his confidence, and give him some reassurance. Examination of the heart, arteries, and lungs should be carried out; it was essential to know of any degree of anaemia, and the blood urea was an excellent criterion of general bodily function. Long operations made shock more likely, and the operation of abdomino-perineal excision had been shortened by the simultaneous work of two surgeons. The anaesthetist should choose the type of anaesthetic which would render the surgeon's work as easy as possible. He believed the best results were obtained after preliminary sedation with omnopon and scopolamine, which he used in preference to morphine, followed by the intravenous use of pentothal. This was followed by a spinal anaesthetic—he preferred percaine. After indicating other anaesthetic procedures, the speaker mentioned the necessity for giving fluids intravenously, and not by mouth, to avoid sickness.

Dr. RONALD JARMAN said that the main points of safety to be considered were the condition and comfort of the patient, team work, type of anaesthetic, and after-treatment. The patient should be reassured and allowed to get to know everybody concerned in looking after him. If the surgeons and anaesthetists were used to working together it made for greater speed and safety. There was not much for the anaesthetist to do after the operation, but he should be prepared to give whole blood or solution in glucose, whichever the surgeon thought necessary. He himself had had five deaths out of 500 cases on the table—two from coronary thrombosis, two with fatty heart, and one from shock—and the range of ages was from 27 to 77. The success of the operation turned

largely on the speed with which it was done. When patients had partly collapsed on the table dramatic recoveries had been seen on giving a pint of whole blood straight away. From the results of his cases he believed that pentothal intravenously, light percaine as a spinal, followed by nitrous oxide and oxygen, were the anaesthetics of choice.

Surgical Procedure

Lieut.-Colonel J. A. MACFARLANE, R.C.A.M.C., said that the relief of obstruction before operation was of the greatest importance. He did not agree that there should be a standard operation; each case should be considered on its merits. Patients should be in hospital for at least ten days before operation and put on a diet of non-residue fluids. If there was evidence of chronic obstruction when the abdomen was opened there should be no hesitation about dividing the operation into two stages, changing one's mind and doing a colostomy, and leaving the patient for a further period of two weeks during which the distal loop should be washed daily. In acute obstruction it was his experience that colostomy as an immediate procedure carried with it a high mortality, and it was his practice to do a blind caecostomy under a local anaesthetic, which got the patient over the emergency and left time for thorough investigation and planning of the best operation for the type of case.

Mr. LAWRENCE ABEL was interested to find that Col. Macfarlane's procedure was so closely parallel with his own. He agreed with what he had said about getting the bowel clean before operation, and his experience was that if the tongue was clean the bowel was clean. No patient who had had a laparotomy should be allowed to drink anything at all until the bowel began to move; water, salt, and sugar should be given by the intravenous route. He recommended the use of fractionated rather than distilled water. A point which had not been mentioned was the question of moving the patient: the more ill the patient the more quickly he should be moved out of bed. The average case with tubes should be moved out of bed a little over twenty-four hours after operation, if only for a few moments, and on the second day for a longer period, and then remain in bed for twenty-four hours.

In some further discussion Dr. MOLLISON pleaded for the use of whole blood rather than plasma or serum; Mr. E. T. C. MILLIGAN mentioned factors which made for speed in operation; Mr. TURNER WARWICK spoke of the importance of guarding against bladder infection; and Mr. DICKSON WRIGHT spoke of the value of dusting the wounds with sulphanilamide powder. In some recent cases he had used a sulphonamide gelatin with excellent results. One advantage was that the patient absorbed the substance into the blood stream and urinary complications were prevented.

Local News

SCOTLAND

Tuberculosis Campaign in Scotland

At the recent annual meeting of the Royal Victoria Hospital Tuberculosis Trust, Edinburgh, Prof. Charles M'Neil, who presided, said that when one looked at the figures for tuberculosis it might seem as if the disease had been conquered. That easy optimism was never entertained by the late Sir Robert Philip, who founded the Trust, nor was it entertained by the executive of the Trust to-day. While the family tragedies which once occurred were now rare, the minute seeds of the disease were still sown within the family, and preventive medicine was addressing itself to the early eradication of infection. Sir William Carnegie said that the executive believed that suitably equipped sanatoria ought to be distributed all over Scotland to work in conjunction with the local authorities. In the annual report of the Trust, which was adopted at the meeting, it was urged that statutory recognition should be given to "care work" in Scotland, including measures to assist the patient before he went into hospital, to help his family, and to consolidate his recovery. This was a special field for voluntary organizations to work in liaison with the official services.

A Comparison between Two Cities

Glasgow and Birmingham are of almost the same population—just over a million—and in an address to the Scottish Branch of the British Hospitals Association recently, Mr. T. W. Place, honorary secretary of the Contributory Schemes Association, used this fact to make a rather telling comparison in favour of contributory schemes. He said that the amount handed to Glasgow hospitals in 1939 was almost the same as that handed to Birmingham hospitals in the year 1926 before the introduction of the contributory scheme—namely, £100,000. But in 1939 the Birmingham hospitals received over £250,000 from the contributory scheme, and in addition paid some £60,000 to hospitals outside the city for treatment given to patients. In 1939 the Glasgow Royal Infirmary received about £34,500 in workers' contributions, plus another £22,000 from general subscribers, whereas in Birmingham the amount handed over to a comparable hospital was £80,000, with another £10,000 from subscribers. The differences were, in his view, an unanswerable case for setting up a contributory scheme in Glasgow. It was mentioned at the same meeting that all the regional committees with the exception of Dundee had approved generally of the proposals for the regionalization of voluntary hospitals, and the scheme was being extended to include hospitals under local authorities.

Incidence of Rheumatism in Scotland

In an address at the annual meeting of the Edinburgh Cripple and Invalid Children's Aid Society, Prof. L. S. P. Davidson said that if some investigations of the incidence of rheumatism in the north-east of Scotland held good for the whole country then 300,000 persons in Scotland went to their doctors annually for treatment for rheumatism of one kind or another. Perhaps 60% or 70% suffered from the simpler forms of muscular rheumatism, but a large proportion were very seriously crippled, and from 50,000 to 60,000 persons in Scotland were crippled so completely as to be unable to work for at least sixty days in the year. He drew attention to the inadequacy of hospital treatment available for chronic rheumatic disease. Probably not more than 10% of those suffering from this condition could depend upon adequate institutional facilities.

ENGLAND AND WALES

The Birmingham United Hospital

The report for 1940 of the Birmingham United Hospital, which includes the General and Queen's and the Queen Elizabeth Hospital, has now been published. When the effects of air bombardment began to be felt the Board decided that the General and Queen's Hospitals should be organized as casualty clearing stations and that the bulk of the normal civilian work should be concentrated at the new hospital. Nearly 600 beds are now constantly in use at the Queen Elizabeth, whose steel fabric and isolated site render it comparatively safe. At the General Hospital, in collaboration with the Ministry of Health, a system of frequent and rapid evacuation has been worked out by which patients are sent to the country as soon as possible after operation or the completion of other necessary treatment. By this means, though less than the half the usual number of beds is available, the General Hospital actually dealt with a larger number of in-patients in 1940 than in 1939, and the number of operations in the various theatres increased by over 5,000 in the year, this increased surgical work being due mainly to accidents in the black-out and in factories. During the year under review air-raid casualties were treated in the United Hospital. It is stated that the work of the first-aid and rescue parties and of the ambulance service in Birmingham has been excellent. The hospitals receive casualties very soon after the bombs have fallen, and the casualties have been handled well and carefully, with no harmful interference. The Board of the United Hospital has therefore decided that, at no matter what cost, it will continue to provide a casualty service in the centre of the city, so that the wounded may be efficiently treated without the delay and discomfort of journeys to other areas. The buildings of both the General and Queen's are old and fragile, and, deeming it necessary to have some premises in reserve, the Board have taken the basement of some business premises for use as an operating theatre, with three

tables, an *x*-ray room, and a sterilizing plant. This emergency hospital is seventeen feet below ground, with seven floors of steel framework above it, and is ventilated by a forced intake of air. The Board has also assumed responsibility for an outlying subsidiary hospital for convalescent patients.

Salaries of London District Medical Officers

The London County Council is revising the salaries of officers of the district medical service. The proposals of the Hospitals and Medical Services Committee provide, with a few exceptions, for a general reduction in salaries and allowances consonant with a general diminution in the work throughout the county of London. In eight districts, however, the work has been found to have increased, and increases of salaries of two district medical officers and six assistant officers appointed to those districts are proposed. Under the Public Assistance Order, 1930, the consent of the Minister of Health must be obtained before the remuneration of a senior Poor Law officer is reduced, and three months' notice of such reduction must be given to the officer concerned. In cases coming within this provision the revised salaries and allowances will operate from September 1 next for one year or until any reorganization of medical relief districts necessitates their revision; in the remaining cases the proposed effective date is July 1. The reductions of salaries apply in seven cases, and in six of these the provisional allowances are wiped out. The provisional allowances granted to twenty-eight district medical officers are reduced, as are the provisional salaries of forty-three assistant medical officers. Some of the reductions are quite considerable: for example, a salary of £300 is reduced to £165, another of £300 to £210; provisional allowances are reduced, in one case from £165 to £55, in another from £225 to £120, in a third from £124 to *nil*. The largest addition to salaries or allowances proposed is from £225 to £310. The proposals are estimated to result in a saving to the Council of just over £5,000 a year.

Correspondence

America and British Science

SIR,—Some of your readers may have seen my letter to the *Times* of June 20, on the generous gifts recently made to the Royal Society by scientific societies of the United States of America—an earlier one of 10,000 dollars from the American Philosophical Society "for the aid of science in Britain," and now, last week, a gift of 5,000 dollars from the American Physiological Society "for the support of scientific publications in Britain, especially in physiology."

A natural and helpful comradeship between medical men of different countries has always been at least as strong among the physiologists as among those whose work is in other branches of medical science or practice. Certainly we British physiologists are on terms of sufficient intimacy with our American colleagues to know well that the American Physiological Society, like our own, depends for existence and support on the efforts and the contributions of members who are working men of science. Their gift will assuredly have a direct importance for the object which they named in making it; but while we gratefully recognize its immediate and intrinsic value, we shall not miss the wider meaning of the fraternal impulse which determined this fine and generous action. We shall be sure that it symbolizes a desire of our American friends to share with us, as far as national policies allow, in the losses which are being encountered in defence of ideals which are theirs as much as ours.

Such gifts, indeed, are among many signs of the fuller understanding which comes with the recognition of a common peril and a common duty An interchange of medical personnel has begun. The generosity of the Rockefeller Foundation is enabling a chosen batch of students to go to American medical schools; there must certainly be more of such interchange after the war, and in both directions. Qualified American medical volunteers are arriving in this country. Close collaboration in scientific researches more directly concerned with warfare, has for some time been a necessary and well-established condition of America's share in the equipment of our Forces. Surely it is clear that the greatest gain which can come to us, and to the world, from a war in which so much has been and must yet be sacrificed, is this closer and more conscious unity between peoples who have always been bound together, not merely because they speak the same language and share so much of history and tradition, but because their ideals and their outlook on life are, in very truth, essentially identical. To see in the promotion of such unity the best hope for the future, to work for it in every way and to guard it from the weakening effects of sectional aims and factitious differences, seems to be the best acknowledgment that the medical and scientific men of Britain can at present make to the American colleagues who, with a noble and simple generosity, are showing their desire to be identified with our cause.—I am, etc.,

Hampstead, June 22. H. H. DALE.

Crush Injuries

SIR,—In your issue of March 22 there appeared three papers by Bywaters and Beall; Beall, Bywaters, Belsey, and Miles; and by the M.R.C. Subcommittee dealing with crush injuries suffered during air raids that were followed by renal failure and, in many cases, by death from uraemia. A leading article in the same issue drew attention to these so far inexplicable phenomena and called for animal experiments to elucidate them. In these articles the work of E. Andrews of Chicago (*Arch. int. Med.*, 1927, **40**, 548) appears to have been overlooked. Andrews worked on renal and metabolic problems of acidosis, which he induced by giving large quantities of hypertonic NaCl solution to dogs intravenously. During these experiments he accidentally tied a limb of a dog too tight to the operating table so that it became oedematous. On releasing the leg and massaging it immediate and complete anuria set in, followed by a rise of blood pressure, nitrogen retention, coma, convulsions, and death. At necropsy oedema of the brain was found, but no renal lesions were present. The experiment was frequently repeated and identical results were obtained. When the suppression of urine was not complete the urine contained albumin and granular and hyaline casts. The author believes that faulty carbohydrate metabolism in the affected limb was responsible for the results. Andrews also observed simultaneously with the anuria a considerable movement of calcium out of the cells in favour of potassium. On this was based an attempt to counteract the process by giving massive intravenous doses of calcium, and thereby he was able to institute immediate diuresis with subsequent recovery of the dog.

All the human cases of crush injury under air-raid conditions can be said to suffer from acidosis induced by starvation and exhaustion. In the paper by Bywaters and Beall a lowered alkali reserve was in fact observed and taken for an indication to stop further saline administration. All the reported cases showed considerable oedema of the crushed extremity. Thus, the parallelism of these cases with the experiments of Andrews appears rather convincing, and his attempt at reversing the condition seems to merit close attention.—I am, etc.,

London, W.1, June 15. G. SCHOENEWALD.

Da Costa's Syndrome

SIR,—Dr. Paul Wood has rendered an important service by the publication of his Goulstonian Lectures. It may be hoped that they will assist medical officers in the Services and members of Ministry of Pensions Medical Boards in dealing with these difficult cases, which can no longer (as in the last war) be classified simply as "V.D.H." or "D.A.H."

Dr. Wood has enumerated the aetiological factors that have been described by various authors, but it may be doubted whether many of these writers had much "first-hand" knowledge of the soldier's life. No one doubts that personal and family histories are of great importance, but there were many other factors in the last war that conduced to the production of Da Costa's syndrome, and, apart from deliberate attempts to obtain discharge from the Service by eating toxic substances—for example, cordite, soap, or tobacco—there were many other causes. One potent factor was the endeavour to train recruits (too often entirely unaccustomed to physical exercises in civil life) in the minimum time. The instructors were usually hard-bitten old soldiers who showed their contempt for "conscripts" by shouting: "I'll make you or break you."

Another aetiological factor was excessive smoking, especially before breakfast. I have often seen recruits going down to

the ablution benches smoking at 5.30 a.m. (reveille was earlier in those days!). May I relate a personal experience that convinced me that tobacco might be a cause of Da Costa's syndrome? In 1935 I began to suffer from moderate dyspnoea on exercise, occasional (L.) inframammary pain, and palpitation. I consulted Dr. G. E. S. Ward. His first question (after an electrocardigram) was: "How many cigarettes do you smoke?" I replied: "I seldom smoke in the daytime, but may smoke six or eight cigarettes when reading after dinner." Dr. Ward's comment was: "You take your poison in concentrated doses; you must cut it down." I replied: "If that is the cause I will cut it out entirely." I did so, and all the disquieting symptoms vanished quickly. I have smoked only one cigarette since September, 1935; that was pressed upon me by a friend at a mess dinner four years later. I did not enjoy it and have not felt any desire to smoke again. In October, 1939, I was passed "fit for general service." The medical officer who examined me said that my blood pressure was only 135/90. While I smoked my systolic blood pressure had been 142 to 146 for more than twenty years.

We know that Vaquez and other eminent French cardiologists considered that tobacco, alcohol, and black coffee were the three most potent causes of cardiovascular disturbances. Fifty years ago no men in training for athletic sports were permitted to smoke. Is it not probable that the modern relaxation of that rule has not improved the health of the rising generation?—I am, etc.,

Nether Stowey, June 13. C. W. J. BRASHER.

SIR,—I was much interested in Dr. Paul Wood's lectures (May 24 and 31 and June 7), and I wish to compliment him on his magnificent work. Personally it afforded me peculiar gratification inasmuch as I had, to a certain extent, arrived at similar conclusions in another sphere of research. Like him, I hope that the diagnosis "effort syndrome" will be dropped, but, like many others, I also hope that no more syndromes or diseases will receive a person's name, and for the want of a better term I suggested "emotional D.A.H." in a preliminary report published in the *Practitioner* in September, 1940.

In all the cases I have investigated, a *central taint*, the result of fear, could be discovered, but I am not unmindful of the fact that strain may be an aggravating factor. Furthermore, it is my opinion that D.A.H. is relatively a lesser concern in this war because the Army is now largely mechanized, and in that way the soldier's heart is not subjected to the strain of the old foot-slogging days.

I have found children's hearts a fertile field for research, and during the last year I have been investigating such hearts under the auspices of the L.C.C. and the Finchley Borough Council. This work was unfortunately interrupted by enemy action and has been further delayed by my inability to get permission from the local authority to examine children's hearts in this area, despite the offer of full co-operation from the War Office and hospitality at the county hospital.—I am, etc.,

Solva, Pembrokeshire, June 11. J. STEPHEN LEWIS.

Treatment of Mustard-gas Lesions of the Eye

SIR,—An instruction (E.M.S. I.252 (revised)) on this subject has been widely distributed to the officers, consultants, and hospitals of the Emergency Medical Service. It came before the Medical Board of Moorfields Eye Hospital "for your information." The Medical Board considered the instruction and felt that several points in it required comment.

1. The use of albucid solution is advised at first-aid posts and at hospitals in cases in which the eyes have been affected by gas vapour or gas splashing. It must be pointed out that the use of sulphanilamide preparations is not directed against gas contamination but only against subsequent infection of the conjunctiva, and that opinion as to its efficiency in this latter respect is far from being generally favourable.

2. No mention is made in the instruction of the very diverse lesions which may be produced by gas, most of them slight and very few of them serious.

3. No indication is given of the treatment necessary when the cornea is definitely involved, and while water is advised for irrigation of the eye at an incident and at first-aid posts, no advice is given as to the lotion to be used for the irrigations recommended at hospitals.

It would appear that this instruction is not in fact the "result of further experience" and should be withdrawn and replaced by a carefully considered and detailed note based on actual experience obtained in the last war and on substantiated experimental evidence.—We are, etc.,

Royal London Ophthalmic Hospital, June 16. F. A. JULER. MAURICE WHITING.

Differential Diagnosis of Contusion of the Brain and Psychoneurosis

SIR,—Dr. W. A. Brend, in an article in the *Journal* of June 14 (p. 885) on the differential diagnosis of contusion of the brain and psychoneurosis, under the subheading "The Clinical Pictures" makes the following statements: "The outstanding feature in contusion is the headache. . . . The sufferers complain of it at once. . . . They describe the pain . . . as being like that cause by a tight band round the head. In neurosis, on the other hand, headache is not a typical symptom . . . it is often mentioned only at the end of the story almost as an afterthought." The clinical fact is that headache is a typical symptom in neurosis. In actual practice the neurotic patient in the consulting-room or out-patient department nearly always complains of it, gives it a prominent place in his list of sufferings, and often describes the feeling he experiences as "being like that caused by a tight band round the head"

In the next paragraph Dr. Brend writes: "Inability to concentrate is the other cardinal symptom in contusion. . . . A characteristic feature is the forgetting to carry out small intentions. The sufferers go out intending to do something, but return without having done it. . . . The neurotic may complain of inability to concentrate . . . but when pressed to give specific instances he is often at a loss to find any. . . . The contused person is often abstracted; the neurotic is usually too self-centred to leave his luggage in a train." Again, in practice, the clinical fact is that inability to concentrate is a cardinal symptom of neurosis. The neurotic constantly emphasizes the discomfort he experiences as a result of his failure to perform the ordinary routine of the day satisfactorily; and a characteristic feature of this is "the forgetting to carry out small intentions."

Finally, one of the commonest complaints made by the neurotic is that he "feels such a fool" because he is continually leaving his belongings in a train, a bus, a tramcar, or a taxi.—I am, etc.,

London, W.1, June 14. MURDO MACKENZIE.

Orthopaedics

SIR,—The letter from orthopaedic surgeons (May 24, p. 791) contained an unfortunately incomplete statement, which, taken out of its context, can be made to look ridiculous. Some later commentators, with an evident bias against orthopaedics, have shut their eyes to the obvious meaning—namely, that such physical medicine as is used in orthopaedics is a part of orthopaedics. Most people are extraordinarily ignorant of the scope and methods of orthopaedics, and this is suggested even by Lord Horder's recent report on rheumatism.

It is unfortunate that we are called orthopaedic *surgeons*. Because of this many people think of us only as manipulative or operative technicians. Whatever other people would like us to be, the fact remains that our work is not so restricted. Orthopaedics is concerned with the diagnosis, prevention, and treatment of the deformities and disturbances of function of the locomotor system. (I realize that it is easy to pick holes in this: an intracranial endothelioma or a Bartholin's abscess may both interfere with locomotion, but there is complete understanding between neurosurgeons, gynaecologists, and "orthopaedists" in these matters.) The work is done within organizations and in institutions specially designed, equipped, and staffed for the purpose, giving continuity of treatment under unified control from the onset of the injury or disease until maximum restoration has been achieved. At least two-thirds of an "orthopaedist's" time is spent on diagnostic and preventive measures, in which plans must be prepared and decisions taken, determining a period of treatment lasting from a few weeks to many months. We utilize with thankfulness the help of our colleagues in every field of medicine, but in our own particular schemes we are called upon to direct

the whole clinical organization. Equally we co-operate with our medical and surgical colleagues in other fields and leave them to run their shows as they like; often regretting that they do not take more personal interest in the physical therapeutic measures they employ.

The history of the last thirty years of orthopaedics will reveal an intense open-mindedness and keen investigative spirit which has surely contributed very largely to the advancement of medical and surgical practice in modern times. Orthopaedic principles, however, are at least as old as Hippocrates and are not, or should not be, peculiar to orthopaedics.—I am, etc.,

Exeter, June 16. NORMAN CAPENER.

Physiotherapy

SIR,—I have read with such interest the recent correspondence in your *Journal* on the above subject that I am emboldened to crave yet a little more space to sum up the various points which have been brought forward. I feel that I am perhaps privileged to do this, first on account of my advanced age—a fact that I am never allowed to forget by the Army—and, secondly, that I have had the great good fortune to practise this art in types of hospitals and clinics which it has not fallen to the lot of many of the writers to do.

Physiotherapy seems to convey " so little to some " and so " muddled an idea to others " that the attempt to elucidate its aims and objects as set out in letters both in the lay and medical press needs no excuse. In fact were the truth known one could almost apply the words of our beloved Prime Minister: " Never have so many owed so much to so few," to this branch of medicine.

A few pioneers have not only attempted but have succeeded in placing this science on a reputable basis if not on a secure foundation. That the foundation is insecure is not the fault of the pioneers themselves but due to the fact that the peoples of the countries which they have invaded (if such a term is applicable) have been slow to appreciate the benefits of methods with which until recently they have been unacquainted though the majority make use of them. *Timeo Danaos et dona ferentes.*

Physiotherapy belongs to every branch of surgery and medicine, and cannot therefore be relegated to any particular specialty. An adequate knowledge of all its applications requires years of study not only of physics, electrical phenomena, and dynamics, but also of all the organs and tissues of the body, and can therefore be approached only from a very wide perspective. The adviser in physical medicine must above all things be a general practitioner in its widest sense. To approach this subject without a comprehensive knowledge of disease in all its forms is doomed to failure. If assistance is to be given to the surgeon or physician in all the various specialties then surely the adviser in physical medicine must have a wider outlook than that conveyed by the term " orthopaedic physician." To subdivide the subject of physical medicine into watertight compartments to suit every specialty would be a waste of human energy both male and female.

I have the honour of serving a certain hospital in the Emergency Medical Service where has been instituted a regular monthly consultation between all the orthopaedic and neurological surgeons and the physiotherapy specialist, which seems to work smoothly and to be of infinite value at any rate to the latter. In the end it saves time, and instead of the passage of notes between one department and another ideas are exchanged in a friendly atmosphere and the patient undoubtedly benefits. Why should not this atmosphere exist in every hospital or institution? To my mind, the answer is that there lingers in the minds of the surgical and medical staff of most of our hospitals an element of doubt as to the efficacy of physical treatment and the integrity of the physiotherapy specialist. If this is the case then surely there is a remedy.

No confidence will ever be established in the medical mind—though it has long been established in the lay mind—until one of our great universities takes up the investigation of this subject and either substantiates or disproves its claims. What better opportunity could exist than the present crisis, when unfortunately plenty of material for research abounds? I would go further and suggest that the university of choice would be Oxford University, which, through the munificence of Lord Nuffield, has ample funds at its disposal for research of all kinds. Are we to leave this work once again to our allies the Americans or our present foes the Germans? Cannot Britain for once be first in the field and demonstrate to the rest of the world that even in the midst of war her energies can be directed towards reconstruction in a tangible and humane manner?—I am, etc.,

Northwood, June 19. L. D. BAILEY.

The Field of Physiotherapy

SIR,—The executive committee of the Society of Physiotherapists have read with interest the annotation on " Physical Medicine, Orthopaedics, and the Services," published in your issue of April 26, and the correspondence which has followed it.

The British Medical Association was mainly responsible for the establishment of the National Register of Medical Auxiliaries, which pledges the physiotherapist registered therein to work under medical direction. We are therefore surprised to note in the letter from the British Orthopaedic Association published in your issue of May 24 that " the British Medical Association, in one of its most successful reports, deplored the system by which surgeons treated their cases to a certain point and then handed them on to masseuses and physiotherapists, so that the surgeons knew nothing of the end and the physiotherapists knew nothing of the beginning." From this statement it would appear that the British Medical Association were discouraging the employment of a body of trained medical auxiliaries whose registration they had promoted and sponsored.

The confusion which still exists in the field of physical medicine is to be much regretted, and the registered physiotherapist has suffered much on account of this. He has been specially trained for this field and his qualifications limit him thereto and to work under medical direction. Physical medicine needs its trained administrators as much as any branch of therapeutics, yet through lack of appreciation of this point many members of the medical profession employ the non-registered worker in this field. We have many examples of this, and have been in communication with the British Medical Association recently on the subject. In this connexion Sir Morton Smart's remarks in your issue of May 24 on the dilution of labour in our field are most timely, and his warning should not be disregarded.

It has been obvious for some time that some authoritative control of physical medicine is essential: whether this is Governmental or independent is not of great import; but it is essential that the right members of the medical profession who know its history, its scope, and its services should be in control of it. May we hope that the correspondence published in your columns will stimulate interested members of the medical profession to take counsel together and endeavour to bring order out of the present chaos.—I am, etc.,

W. D. A. BURNELL,
Chairman, Executive Committee, Society of
London, S.W.1, June 14. Physiotherapists.

Hospital Administration

SIR,—Some play is made in the current issue of a periodical called the *Hospital*, the official organ of the British Hospitals Association and of the Incorporated Association of Hospital Officers, with the advocacy of lay as opposed to medical internal administration of hospitals. This advocacy is quoted as coming most recently from three doctors, in a literary effort entitled " Post-war Hospital Services " and published in the *Lancet*. Reference is also made back to the utterances of a fourth doctor who is styled the *Lancet* Special Commissioner and who expressed similar views. I make no comment upon the fact that the *Lancet* has twice provided grist for this propaganda mill directed against a section of the profession for which it is published. An attempt is also made to rope in the leading article in the *British Medical Journal* on medical man-power, but it misses fire badly because the remarks quoted had no reference to medical superintendents. I would expect the *Journal* to be conducted with too great a sense of dignity and justice to lend itself to an attack upon a medical section which these glib critics describe as " harassed officers, overburdened with work."

So far as I know, no medical superintendent or medical journal has, so far, made an attack upon the type of official variously described as secretary, secretary-superintendent, house governor, or administrator, with or without some letters appended. I do not intend to do so and I hope none of my

colleagues will so demean themselves. Lay hospital officers are, like medical superintendents, busy people with a war on their hands. I will, however, make a few general observations addressed in particular to the type of medical critic which has been quoted.

They are, all four of them, much of an age and class so far as can be gathered from the information supplied by them to the *Medical Directory*. I would remind them that they write at a time when a large proportion of their age group is away serving with His Majesty's Forces, and that we will, by their leave, postpone these heavy decisions until those gentlemen who survive are with us again and in a position to add the weight of their views and experience. What serious-minded and experienced full-time hospital workers, medical and lay, are seeking is not a paper revolution in the absence of so many colleagues, but a sane evolution when they return. In the meantime, responsible persons will have no difficulty in putting statements such as that "the post of medical superintendent should be abolished" at their proper valuation. I would say the same, at the present time, of a similar statement regarding lay administrators.

In the final reckoning this question of medical superintendent or lay administrator will not be settled by the authors of "Post-war Hospital Services," or by the *Lancet* Special Commissioner, or by the British Hospitals Association, or by the Incorporated Association of Hospital Officers. It will not, in fact, be settled by any assiduous section grinding a busy axe. It will be settled by the common people, whose servants the hospitals are—by the force of public opinion expressed by their representatives on controlling bodies in the light of their own knowledge gained by experience.

At the present time all mental hospitals, municipal hospitals up and down the country on an increasing scale, many special hospitals, and even some "voluntary" hospitals, are administered by medical superintendents. Other "voluntary" hospitals have, to meet the needs of the Emergency Medical Service, so designated a member of their medical staff. That is a weighty fact. Medical superintendents can, and will, await the decision for their extension or abolition with equanimity. Time, the stress of war, and the knowledge which comes with experience will all work towards a correct and wise decision. I have friends among lay administrators and have too much regard for their worries and difficulties at this juncture to make an attack upon them as a class. Let us get on with the war and leave these spates of frothy wisdom until the piping times of peace, when our colleagues will be with us to help in building something worth while from the wreckage.—I am, etc.,

Reading, June 10. D. CYRIL THOMAS.

Chronic Sick in Bombed Towns

SIR,—The urgent and important problem in the hospital administration of this country raised by Sir Frederick Menzies concerns every large municipality, and is one which up to the present has not been solved. At this stage the Ministry of Health could with advantage include it in its new sphere of action in dealing with hospital accommodation generally. The Ministry before the outbreak of war did not intrude itself too obviously except in an advisory capacity in the administration of our hospitals. It has now launched the Emergency Hospital System and controls a large number of emergency hospitals all over the country.

The chronic sick question, with which Sir Frederick is fully conversant in his capacity as late Medical Officer of Health to the L.C.C., has reached the stage when only the Ministry of Health can and should deal with it. Estimates of the number of air-raid casualties anticipated at the outbreak of war have up to the present, fortunately, proved to be wrong. It is still possible that a larger number of beds may be required than have yet been called upon. These thousands of beds occupied by the chronic sick in our large industrial areas would be invaluable under such conditions.

The humanitarian aspect so rightly stressed by Sir Frederick is one which should appeal to all. It is astonishing that the leaders in our churches, our religious societies, or some strong voice from this wilderness of chaos, have not cried out on behalf of these poor and tormented souls. I have seen no record of any concern or effort by our colleagues in the House of Commons. This is surely a subject which should come within their purview. At the present time humanitarian grounds alone are sufficient reason, and indeed the principal one, for urgent steps to be taken for the transfer of these sick persons to quiet rural areas.

Large numbers of country houses have been taken over by the British Red Cross and other charitable societies. They have been fully equipped, and most of them staffed by local V.A.D.s, to take in patients. They are still empty and the V.A.D.s are bored and disheartened with no work to do. I have found that nursing staff who can nurse these chronic sick efficiently are competent to nurse any case. They are excellent material for the training of nurses in their profession, and our V.A.D.s would be all the better for this opportunity of relieving trained nursing staff of this arduous and important national duty.

I would not stress the economics of keeping chronic sick in urban areas at the present. This is a question which should have been settled in the pre-war period. It is so full of difficulties that all discussions seem to have led to no settlement. It is like playing with nettles. The old adage "Grasp a nettle and it will not sting" seems to be an appropriate one to this subject. The cost per patient in our large hospitals and institutions in urban areas varies from £3 to £6 a week. This in itself is a problem calling for serious thought. Whereas the healthy wage-earner is expected to pay his rent and rates and bring up his family on an average of £3 a week, the expense of maintaining the chronic sick is one which economists might well delve into. My view is that, economically, the present way of dealing with chronic sick is impossible, and will sooner or later have to be handled drastically. There are many interpretations of the term "chronic sick," and indeed each case has to be considered individually. Many of the patients are senile, others suffer from permanent or chronic disabilities. However, this is not the occasion to discuss this aspect.

The need now is for "evacuation" (not to other industrial areas), making use of all available accommodation in quiet rural areas where the majority of these persons can end their days away from the noise of gunfire and bombs and the fear of impending disaster. Above all let them not be evacuated to institutions where the stigma of "workhouse" still prevails. The "workhouse" dies hard, and this indignity would merely add to their mental anguish and troubles. Our care of the chronic sick in the past has been an example to all civilized countries. Let us not fail in our duties in these critical days—I am, etc.,

June 12 "DE SENECTUTE."

Treatment of Injuries of the Fingers

SIR,—May I express my complete agreement with Mr. J. B. Oldham's letter (June 14, p. 906) and in particular with the functional and cosmetic advantages of amputation through the metacarpal shaft where this is indicated. There is, however, one further point which should be stressed—namely, that the greater the injury to the hand as a whole the greater the relative advantages of conservative treatment become. One crippled finger in an otherwise perfect hand is a "lame duck" which hinders the rest. The same finger in a damaged hand may contribute its full share to the use of that hand.

A case of mine may illustrate this. Six years ago a shoe operative had the misfortune to have his left hand caught in a press. The flexor sublimis tendons to all four fingers were severed, and the flexor profundus tendons to the middle and little fingers as well, across the proximal phalanges. I sutured each with a single stitch of fine catgut and excised and repaired the wounds. The hand, wrist, and elbow were kept in flexion. He had no later treatment except the movements that he could do himself; in these he was intelligent and persevering. I saw him a few days ago, and, having this correspondence in mind, asked him if he thought I had been in error in failing to amputate his fingers. His reply was appropriate, but cannot be given verbatim. I gather that he is quite satisfied with things as they are. He can flex his hand as a whole, and the index and ring fingers separately. With it he can do a full day's work at his old job, and has done so ever since his recovery from the injury. He also cultivates his garden and an allotment in his spare time. Admittedly he does not have to do fine and accurate work with the damaged hand, but he can do all that he wants to do, and much more than he could have done without his fingers.—I am, etc.,

Glastonbury, June 16. R. M. AINSWORTH.

Subcutaneous Ligature of Veins

SIR,—Dr. H. S. Russell's reply (June 7, p. 870) to the critics of his operation for varicose veins of blind ligature somewhere in the thigh, followed by injections of sodium morrhuate, constrains me to add my deprecation of this dangerous and inefficient procedure. I do so because sodium morrhuate is of variable chemical composition, and enough sudden deaths and anaphylactic collapses have been reported following its use to warrant its final abandonment for the injection of varicose veins, especially as there are many other safer and more effective substances (quinine and urethane, sodium salicylate 30%, quinine and urethane followed by lithocaine). Sodium morrhuate at best is a poor sclerosing agent.

I have been interested in the operation of simultaneous ligature and injection of gross varicose veins since 1932, and have performed the operation between two and three hundred times. A follow-up has shown that if any ligature is placed lower than the actual union of the internal saphenous vein with the femoral vein it will be followed by recurrence in a high percentage in a period of three months to three years. J. B Oldham's experience corresponded with this. I entirely agree with Mr. N. L. Eckhoff's letter (May 10, p. 729), pointing out the weakness of Dr. Russell's method. I would condemn it as being dangerous to patients, of doubtful service to their need, and likely to bring disrepute to the good name of surgery for varicose veins.—I am, etc.,

London, W.1, June 10. HAROLD DODD.

"Egyptian Tummy"

SIR,—"Gippy tummy" differs clinically in no way from the so-called "Madeira fever" or "Riviera gripes." Colic, diarrhoea, often fever and vomiting present a picture of severe enterocolitis or gastrocolitis. Heat, flies, and filth seem to be the prerequisites of the attack, which is represented in this country by its summer diarrhoeas and food poisonings.

Both in Egypt and Madeira one's chances of dodging the complaint are increased by avoiding uncooked food (except peeled fruit), milk, and water from the tap. I share Sir James Barrett's view (June 14, p. 906) that this is an infective disease which may be influenced, but certainly not caused, by climatic changes. That causative organisms have not been isolated is partly due to lack of enthusiasm to find harmful microbes in expensive winter health resorts (the visitor is always assured that he has been eating too much fruit); partly to lack of facilities for investigation of fresh stool passed early in the attack; and partly to the inherent difficulties of isolating the organism which apply equally to food poisoning in England as elsewhere.—I am, etc.,

London, W.1, June 13. A. H. DOUTHWAITE.

Abdominal Pain after Opium

SIR,—I have read with great interest the account given by Col. H. L. Tidy (June 7, p. 870) of the experiments carried out at the Mayo Clinic to show the effects of morphine on the biliary ducts and the sphincter of Oddi. Some time ago in the *Journal* I drew attention to these experiments in an article on the exploration of the common bile duct for stone,[1] and, if I mistake not, the present discussion was initiated by Dr. J. B. Williamson in a letter with reference to this article—a letter in which he recorded the adverse effect of morphine on one of his patients who had undergone cholecystectomy.

It is to be noted that in the cases investigated at the Mayo Clinic the gall-bladder had been removed, and there is evidence to show that in such cases the sphincter of Oddi alters somewhat in function. Col. Tidy recalls that when a meal is taken the gall-bladder contracts, the sphincter of Oddi dilates, and bile runs into the duodenum. Doubilet and Colp[2] found that after cholecystectomy neither an ordinary meal nor a fatty meal had any influence on the sphincter of Oddi, the sphincter in one case remaining closed for not less than forty minutes after a fatty meal. Furthermore, it must be remembered that all these experiments were carried out on patients who had suffered from pathological conditions of the biliary tract and who were still probably suffering from spasm of the sphincter of Oddi. There is no evidence in the notes of the cases to show that dilatation of the sphincter had been carried out at operation—a step advocated by surgeons generally, including some of the surgeons at the Mayo Clinic.[3] In fact Walters and others[4] suggest the use of morphine as a diagnostic measure in cases with a post-cholecystectomy syndrome—an attack of pain following the administration of morphine being strongly suggestive of sphincter spasm or overlooked stone in the common duct. I have not known of any case of biliary colic following dilatation of the sphincter, and although I have not carried out any investigations to show the effect of morphine on the dilated sphincter, it happened that in one of my cases omnopon (52% morphine) was inadvertently given before cholangiography; this drug did not seem to interfere with the free entry of the opaque medium into the duodenum.

Whether morphine has any effect on the intact or healthy biliary apparatus is another question. Cases are known where repeated administration of morphine gives rise to clay-coloured stools, but not to biliary colic, and the conclusion to be drawn from the investigations already mentioned is that biliary colic following morphine is highly suggestive of a pathological condition of the biliary apparatus.

Biliary colic, however, will hardly explain the abdominal symptoms in every case in which the patient displays an idiosyncrasy to morphine. It would not seem to be the answer to the remarkable series of cases published by Mr. Winsbury White (March 22, p. 461), or the experiences recorded by Drs. Stephen Falla (May 17, p. 763) and Marcus Liddle (May 3, p. 688). From the clear account given by these observers severe spasm or colic of some other part of the gastro-intestinal tract would appear to be the cause of the untoward symptoms. Further experiments carried out at the Mayo Clinic support the views of Dr. Falla. McGowan and others[5] showed by *x*-ray that morphine produces spasm of the duodenum, and similar effects in the large intestine following morphine were observed by Jackman and Bargen.[6] The latter observers found that atropine was not very helpful as an antispasmodic; traesentin was much more effective; best of all was spasmalgin (papaverine compound).

Some doctors are still very reluctant to give morphine after abdominal operation for fear of causing ileus, but a great many surgeons believe that the increased tone and peristalsis produced in the small intestine by the drug prevents rather than gives rise to ileus. In fact it is the practice of some surgeons to combine morphine with prostigmin *before* abdominal operation in an effort to forestall this complication.—I am, etc.

London, W.1, June 16. MICHAEL J. SMYTH.

REFERENCES
1 *British Medical Journal*, 1941, **1**, 111.
2 *Surg. Gynec. Obstet.*, 1937, **64**, 622.
3 Ibid., 1936, **63**, 417.
4 Collected Papers of the Mayo Clinic, 1937, **29**, 32.
5 Ibid., 1937, **29**, 55.
6 Ibid., 1938, **30**, 73.

Vitamin C from Rose-hips

SIR,—Dr. K. E. Barlow (May 24, p. 797) draws attention to the value of rose-hips as a source of vitamin C, with a reference to their use in Denmark. Dr. Barlow is right, as wild rose-hips are used all over the Continent for this purpose, and the Germans planted rose-hips along their new country roads, as well as using now the hips of the conquered Eastern European countries for this purpose.

The *Annales Paediatrici* (Basle), in May, 1939, published an article on this matter entitled "Der C-Vitamin-Gehalt verschiedener Hagebuttenspeisen," by Drs. Gedda and Kjellberg (Vol. 153, No. 2), on work done at the Children's Hospital in Gothenburg, under Prof. Arvid Wallgren. Work has also been done in Scotland by Miss Andross of the West of Scotland Domestic Science College on the preparation and popularization of wild-rose soups. During the past two years I have been collecting and translating Continental recipes and testing and adapting them for easy use in this country. The suggestion that wild rose-hip preparations should be used in welfare centres was put before the Maternity and Child Welfare Section of the Society of Medical Officers of Health in summer 1940, and welcomed as a possibility, if arrangements could be made for preparation and delivery to the centres. During last year negotiations were carried out between the Women's Institutes and several other organizations by members of the Food Education Society and myself, with regard to the organization of parties for picking and preparation of hips. Prof. Drummond, in replying to questions concerning the preparation of rose-hips, writes: "The Eastern hip is a much larger and juicier one than that obtained in this country. Nevertheless, we should do all we can by

local organization to make use of foodstuffs of the woods and hedgerows."

There are also difficulties in the making of hip preparations here which need to be overcome; notwithstanding this fact, all the hip preparations which I finally succeeded in making last year and the year before from local wild hips were attractive in appearance and of a delightful flavour. In one instance where hips were put before a children's party and put on the table without a word with other jams, it was the hip-jam pot which was emptied first.

I am enclosing a leaflet which was prepared last year and which gives the recipes that have been tested. I agree with Dr. Barlow that if official recognition could be obtained for wild rose-hips, a most valuable addition would be gained for the nation's sources of vitamin supply.—I am, etc.,

Hedgerose, Buckland Common, Tring, Herts, May 29. CLAIRE LOEWENFELD.

Sulphapyridine in Subacute Bacterial Endocarditis

SIR,—Dr. J. G. Macleod (June 21, p. 927) contrasts the results in cases treated with sulphapyridine and heparin with those in cases treated with sulphapyridine without heparin. The former method of treatment has as yet justified no hope, but by the latter a few hopeful results have been obtained. These, however, should be contrasted with results without the use of either heparin or any sulphonamide—for instance, with that in a case which I recently described (*Lancet*, 1941, 1, 630), in a portion of the cases referred to by J. A. Capps (*Ann. intern. Med.*, 1939, 13, 280), those of M. Haines (*Lancet*, 1941, 1, 681), and those of E. Libman, in his pioneer observations of 1913 (*Amer. J. med. Sci.*, 146, 625). In spite of this last class, though remarkable remissions have occasionally been observed—I have heard of one case in which there may actually have been recovery, as the patient was lost sight of after remarkable improvement—I am nevertheless in favour of trying sulphapyridine, because without treatment, if a stage is reached in which all signs of active infection disappear and remain absent, the damage already done (notably results of cerebral embolism) is likely to be already so great that one is not justified in speaking of *recovery from the disease*, though one can suppose there has been recovery from the infection.—I am, etc.,

London, W.1, June 21. F. PARKES WEBER.

Medical Planning Commission

SIR,—At the first meeting of the Medical Planning Commission Lord Dawson of Penn is reported (May 17, p. 759) to have said: "The practice of medicine in all its branches must become increasingly institutional." What, I ask myself, are the full implications of this statement? Does it imply that more and more patients will be treated in hospital, or does Lord Dawson include his primary centre, which the late Sir James MacKenzie considered, in my opinion quite wrongly, as almost the only commendable part of the scheme set forth in a notable Cavendish lecture?

Such institutional medicine as can be carried out in a fully equipped primary centre would inevitably tend to decrease the subsequent need for treatment inside a hospital. Shall we never seek to implement our oft-expressed opinion that the general practitioner is the backbone of the profession by giving him as easy access to the means of early diagnosis and treatment as has the consultant, general or specialist? Such possibility of early diagnosis and treatment should be available to every member of the community irrespective of the individual's means, and the Medical Planning Commission might well make such provision its first consideration. No medical scheme without it can be really satisfactory.—I am, etc.,

London, W.8, June 16. HAROLD H. SANGUINETTI.

R.M.B.F.: Loss in Income of £1,292

SIR,—The above heading sufficiently explains the reason for this letter. This loss in annual income is very largely due to the fact that many of our regular subscribers practising in towns heavily bombed have suffered serious financial loss and have had to reduce or cancel their subscriptions. Their number may well increase before the war is over.

Everybody knows the beneficent work of the Royal Medical Benevolent Fund in helping those members of our profession, their wives, widows, and children, who are living in straitened circumstances, and who, in many cases, are quite unable through age and infirmities to do anything to help themselves. The committee has done everything possible to cut down overhead charges. Administration is carried out with a reduced staff in less costly offices. Expensive annual reports have been abolished, and one way and another we have managed to effect a considerable saving in our annual expenditure.

Unfortunately, however, this is not nearly enough, and if the work is not to be seriously crippled we must get more help. We need donations to meet the present emergency, and especially we need many more annual subscriptions. Poverty is hard to bear under any circumstances, but when accustomed help is curtailed and prices are soaring—as is the case to-day—then the position may well become desperate.

Here is a passage from a letter which reached me the other day: "I am sending you a donation as a thank-offering for the fact that circumstances have placed my life in a spot where there is less danger from enemy action than is the case with my brother practitioners." I appeal to all your readers who feel that they are in similar fortunate circumstances to come forward at this critical time to help in carrying out our duty to our distressed colleagues. Contributions should be sent to the Royal Medical Benevolent Fund, 1, Balliol House, Manor Fields, Putney, London, S.W.15, and will be gratefully acknowledged.—I am, etc.,

ARNOLD LAWSON,
June 18. Chairman of the Committee of Management.

Obituary

JOHN RHODES DICKSON, O.B.E., M.B., C.M.

News has been received of the death of Dr. John Rhodes Dickson of Port of Spain, who has been a member of the British Medical Association for thirty-three years and was appointed honorary secretary of the Trinidad Branch in 1932.

Dr. Dickson was a medical student at the University of Edinburgh and graduated M.B., C.M. in 1889. He took the D.P.H. of the English Conjoint Board in 1899, the D.T.M. of Liverpool in 1908, and the B.Sc. (Public Health) of Edinburgh in 1909. After long service as deputy surgeon-general and medical inspector of health for Trinidad and Tobago he became medical and health officer to the Imperial College of Tropical Agriculture, Trinidad. He represented his Branch at the Annual Meetings of the B.M.A. at Dublin in 1933 and at Oxford in 1936.

At its last meeting the Trinidad Branch Council passed a resolution expressing sorrow at Dr. Dickson's death and condolence with his family, and the president, Dr. Eric de Verteuil, in moving the vote, paid tribute to his memory: "With the passing of Dr. Dickson," said Dr. de Verteuil, "we have lost an esteemed and respected colleague, a devoted and conscientious secretary, and above all a true, fast, and sincere friend. In this Council and among us here now, we may, I am sure, claim to have some of his most intimate, sincere, and genuine friends—friends who were able to value at their true worth his remarkable qualities of mind, character, and devotion to duty and to the public good, the richness of which appeared to grow brighter and to become more accentuated as the years rolled by. Dr. Dickson was fortunate in retaining to the end a full degree of his mental vigour, his gentle yet dignified bearing, and his cheerful and lovable nature. And we too in turn were blessed in sharing this good fortune."

Dr. GEORGE HENRY DUPONT, who retired in 1938 after having held the position of medical officer of health and school medical officer for Twickenham for twenty-eight years, died on June 11. He studied medicine at the University of Edinburgh, graduating M.B., C.M. with honours in 1893, and proceeding to the M.D. in 1898; four years later he took the D.P.H. of the English Colleges. In addition to his official posts in the Borough of Twickenham Dr. Dupont had been consulting physician to St. John's Hospital, Twickenham, and consultant to the Metropolitan and City Police Orphanage until its closure. He was a Fellow of the Society of Medical Officers of Health, a member of the Royal Sanitary Institute, and author of the Health Reports for Twickenham from 1910 to 1938, when he was made consulting M.O.H.

The Services

NAVAL AWARDS

Surgeon Commander John Joyce Keevil, R.N. (H.M.S. *Illustrious*) has been awarded the D.S.O. for great courage and devotion to duty in the face of enemy air attack.

Surgeon Captain J. Martin, R.N. (ret.) has been awarded a Greenwich Hospital Pension of £50 a year in the vacancy caused by the death of Fleet Surgeon J. H. Acheson, R.N. (ret.).

Temporary Surgeon Lieut. Thomas Tibbott Davies, R.N.V.R. (H.M.S. *Illustrious*) has been mentioned in dispatches.

AUXILIARY R.A.M.C. FUNDS

The annual meeting of the members of the Auxiliary R.A.M.C. Funds will be held at 12 noon on Friday, July 11, at 11, Chandos Street, Cavendish Square, W., when the annual report and financial statement for the year ended December 31, 1940, will be presented and the officers and committee for the current year elected.

CASUALTIES IN THE MEDICAL SERVICES

ROYAL ARMY MEDICAL CORPS

Missing

Captain Nicolas Shtetinin Seaford.

Universities and Colleges

UNIVERSITY OF CAMBRIDGE

The following candidates have been approved at the examination indicated:

FINAL M.B.—*Part I (Surgery, Midwifery, and Gynaecology)*: R. M. Archer, J. D. Atwell, R. C. Barclay, D. V. Bateman, K. F. C. Brown, L. J. H. Burton, H. Butler, W. H. Chase, R. E. W. B. Comerford, E. D. Cullen, P. M. Daniel, B. Dansie, F. M. P. Eckstein, E. J. S. Evans, C. L. Grandage, R. E. A. S. Hansen, D. V. Harris, A. Holmes-Smith, E. B. Jarrett, R. Jenkins, J. S. Johnstone, K. H. Lim, L. R. McLaren, H. L. McMullen, J. M. Mungavin, P. H. Nash, T. P. Pattinson, A. G. E. Pearse, G. E. Pinkerton, G. K. Riddoch, P. Sainsbury, J. L. S. Smith, A. G. Stansfeld, J. H. Tasker, H. D. Teare, D. E. Thompson, D. G. Vulliamy, A. Waymouth, H. G. Wolskel. *Women:* H. M. Comely, A. Davies, D. H. King, M. Redfern Davies.

UNIVERSITY OF GLASGOW

William John Brownlow Riddell, M.D., D.O.M.S., has been appointed to the Tennent Chair of Ophthalmology from October 1, in succession to Prof. A. J. Ballantyne, who retires under the age limit

Medical Notes in Parliament

Mental Hospital Staffs

On June 17 Mr. SORENSEN asked the Minister of Health whether he was aware of the increasingly serious situation in mental hospitals through the withdrawal of male nurses to the Forces, and if he was considering the possibility of an extension of the Essential Works Order to cover the need of these hospitals. Miss HORSBRUGH replied that as regards withdrawal of male nurses for the Forces, no change had been made in the Schedule of Reserved Occupations. Male nurses over 30 were not called up, and those under 30 were called up only for service in their profession. Applications for deferment of individuals received full consideration by the Minister, and in suitable cases recommendations for deferment were made to the Ministry of Labour and National Service. The Essential Works Order did not affect military service, but the Minister had under consideration the question whether an order of similar effect should be made in respect of mental hospitals.

Committee on Medical Man-power

Sir Francis Fremantle was informed by Mr. ERNEST BROWN on June 19 that Mr. Brown, the Service Ministers, and Mr. Johnston had decided to set up a committee to investigate, in the light of the recommendations of the committee presided over by Sir Arthur Robinson, what further steps could usefully be taken to secure the utmost economy in the employment of medical personnel in His Majesty's Forces, the Emergency Hospitals Scheme, and the Civil Defence Services, and all other medical services, including general practice. This committee was to report from time to time what should be the allocation between these services of the available medical personnel. It would begin its work at once. Its members were: Mr. Geoffrey Shakespeare (Parliamentary Under-Secretary for the Dominions), chairman; Prof. R. M. F. Picken, M.B., D.P.H.; Sir Alfred Webb-Johnson, F.R.C.S.; J. Crighton Bramwell, M.D., F.R.C.P.; Prof. Sydney Smith, M.D., D.P.H.; J. A. Brown, M.D.; William Malcolm Knox, M.B., Ch.B.; and medical representatives of the Admiralty, the War Office, and the Air Ministry. In addition the following agreed to be closely associated with the work of the Committee: Sir Charles Wilson, M.D., P.R.C.P., Sir Hugh Lett, Bt., P.R.C.S., and H. S. Souttar, C.B.E., M.D., F.R.C.S. (chairman of the Central Medical War Committee).

Mr. RHYS DAVIES asked if the committee would inquire into the difficulties of panel practice in National Health Insurance. Mr. BROWN replied that the terms of reference were wide.

Medical Advisory Committees

Mr. GROVES asked on June 19 how many medical committees, advisory or executive, were referred to by Mr. Brown in the national emergency; how, when, and by whom they were appointed; and what were their constitutions. Mr. BROWN gave the following list: The Central Medical War Committee and Advisory Emergency Hospitals Medical Service Committee, the appointment and constitution of which had been set out in October and December, 1939, and February, 1941, respectively; Medical Advisory Committee on Rehabilitation, consisting of a number of specialists on this subject invited by the Minister in November, 1940, to advise the Director-General, Emergency Medical Services, from time to time on the rehabilitation of patients under the Emergency Hospitals Scheme; Standing Committee on Physiotherapy, consisting of medical practitioners with special experience of this treatment, selected in July, 1940, by the Minister's consultant advisers in collaboration with official representatives of the specialists concerned, to advise the Director-General, Emergency Medical Services, on the facilities required for this treatment in hospitals under the Emergency Hospitals Scheme; Lord Horder's Committee on conditions in air-raid shelters (with particular reference to health) appointed on September 14, 1940, jointly by the Minister of Health and the Minister of Home Security, and consisting of Lord Horder as chairman, a senior medical officer of the Ministry of Health, the chief engineer of the Ministry of Home Security, and two lay representatives of voluntary organizations.

Medicine Stamp Duties

Captain CROOKSHANK said on June 19 that before the announcement of the abolition of the Medicine Stamp Duties their yield in a full year was estimated to be £800,000. The yield of the Purchase Tax on prepared drugs and medicines might in a full year be of the order of £3,000,000. Sir KINGSLEY WOOD on the same date told Mr. Horabin that he would not consider the introduction of a Bill to legalize the administration of the Medicine Stamp Duties. The legal action brought by Messrs. Woolworth merely illustrated the difficulties to which the administration of these antiquated Acts continually gave rise. Captain CROOKSHANK said on June 18 that before the decision was announced to repeal the Medicine Stamp Duties, proposals were considered for a revised method of taxation suggested by the Proprietary Association of Patent Medicine Manufacturers.

Mr. WHITE suggested on June 19 that widespread advertising of patent medicines, often with an appeal to fear, led large numbers of people to treat their own ailments instead of using the medical services available under the National Health Insurance Acts. Mr. BROWN said he had no specific evidence than any large number of insured persons treated their own ailments instead of consulting their insurance doctors. This was among the matters considered before Sir Kingsley Wood announced the decision to repeal the Medicine Stamp Duties.

National Health Insurance.—On June 10, Mr. ERNEST BROWN told Captain Plugge that the possibility of securing economy by the substitution of a yearly health and pensions insurance contribution

card for the two half-yearly cards now in use had been carefully considered from time to time, and was discussed with the Consultative Council on National Health Insurance shortly after the outbreak of war. After weighing the arguments for and against the suggestion, the Council unanimously decided that they could not then recommend its adoption, but he would certainly see that the matter was considered afresh in the light of present circumstances He pointed out, however, that a yearly card would cover the period of a contribution year, running from July to June, and that the change, if found practicable, could not take effect until July, 1942.

EPIDEMIOLOGICAL NOTES

Infectious Diseases for the Week

The majority of the principal infectious diseases have declined somewhat in England and Wales during the week, with the notable exceptions of dysentery and enteric fever. In Scotland also both diseases are abnormally prevalent, especially enteric fever. About this time last year dysentery was gaining a footing which it established for the three succeeding months of the year. Speed in tracing cases and carriers, strict control over the handling of foodstuffs and instruction in the observance of the elementary rules of hygiene are the golden rules in the prevention of dysentery as well as of enteric fever. Where the communal and individual risk is large, recourse must be had to active immunization.

Scarlet fever advanced very slightly in England and Wales and considerably in Scotland; in both cases it has exceeded the 1940 level. During the last three weeks cerebrospinal fever has declined slightly in England and Wales. Of the 254 cases notified only 28 were in respect of non-civilians.

Dysentery

Despite the increase in notifications, only fifteen administrative areas were affected compared with twenty in the previous week. Lancaster and Surrey remain the chief centres, but an outbreak has appeared in the West Riding of Yorkshire, where last week only one case (in Sheffield) was encountered. More than 3 cases were recorded in the following areas: Lancaster 38 (Blackburn 5, Liverpool 1, St. Helens 1, Blackburn R.D. 8, Warrington R.D. 4, Whiston R.D. 13); Surrey 19, all in Coulsdon and Purley U.D.; Yorks, West Riding, 17 (Bradford 7, Mexborough U.D. 1, Shipley U.D. 9); Chester 5, in Macclesfield M.B.; Hertford 4 (Watford M.B. 3, Hemel Hempstead R.D. 1); London 4 (Kensington 1, Wandsworth 3); Stafford 4, in Uttoxeter U.D.; Caernarvon 4 (Caernarvon M.B. 3, Gwyrfai R.D. 1). In Scotland more than one-half the cases occurred in the burghs of Aberdeen 14, and Dundee 10. Of the remaining ten areas affected, more than a single case was reported only in Aberdeen County 8, Glasgow 3, Renfrew County 3.

Enteric Fever

Enteric fever has increased in geographical distribution as well as in numbers since the preceding week. Twenty-five areas—an increase of five—were involved. Three adjacent counties supplied more than half the total for the whole country—namely, Warwick 23 (Birmingham 14, Coventry 4); Stafford 15 (Smethwick 6, Walsall 3, Wolverhampton and West Bromwich 1 each, Amblecote U.D. 2, Brierley Hill U.D. 2); Worcester 15 (Halesowen M.B. 2, Kidderminster M.B. 7, Stourbridge M.B. 1, Malvern U.D. 1, Bromsgrove R.D. 4). Other areas reporting more than 3 cases were: Lancaster 8, Middlesex 8, London 6, Nottingham 4. In Scotland over three-quarters of the cases notified, which were all of paratyphoid B fever, occurred in Dundee; the remainder were in the counties of Fife 3, Perth and Kinross 2, Sutherland 2, Ayr 1, Lanark 1, Moray and Nairn 1, Renfrew 1, and Glasgow 1.

Cerebrospinal Fever

Despite the recent decline in the incidence of cerebrospinal fever, it remains widespread in distribution. Although forty of the sixty-five administrative areas are involved, in only five were more than 10 cases notified during the week—namely, Lancaster 46, Yorks, West Riding 33, Glamorgan 21, London 16, Warwick 13. In Scotland the disease is less widely distributed, affecting twenty out of the fifty-eight counties and burghs. Only in Glasgow 22, Ayr County 8, and West Lothian County 4 were more than 3 cases notified.

No. 22

INFECTIOUS DISEASES AND VITAL STATISTICS

We print below a summary of Infectious Diseases and Vital Statistics in the British Isles during the week ended May 31.

Figures of Principal Notifiable Diseases for the week and those for the corresponding week last year, for: (a) England and Wales (London included). (b) London (administrative county). (c) Scotland. (d) Eire. (e) Northern Ireland.

Figures of Births and Deaths, and of Deaths recorded under each infectious disease, are for: (a) The 126 great towns in England and Wales (including London). (b) London (administrative county). (c) The 16 principal towns in Scotland. (d) The 13 principal towns in Eire (e) The 10 principal towns in Northern Ireland.

A dash — denotes no cases; a blank space denotes disease not notifiable or no return available.

Disease	1941					1940 (Corresponding Week				
	(a)	(b)	(c)	(d)	(e)	(a)	(b)	(c)	(d)	(e)
Cerebrospinal fever	254	16	56	2	4	275	17	63	1	8
Deaths		—	5				2	8		
Diphtheria	886	42	180	23	21	766	36	253	30	30
Deaths	17	1	6	2	1	13	—	8	—	—
Dysentery	113	4	45	—	—	36	8	34	—	—
Deaths			—	—	—			1	—	—
Encephalitis lethargica, acute	3	—	1	—	—	2	—	1	—	—
Deaths		1	—				—	3		
Enteric (typhoid and paratyphoid) fever	101	6	45	7	—	39	4	7	3	—
Deaths	2	—	—	—	—	3	1	—	1	—
Erysipelas			61	10	6			41	4	5
Deaths		—	—				—	1		
Infective enteritis or diarrhoea under 2 years										
Deaths	74	1	5	6	4	31	—	1	3	8
Measles	13,031	335	146		6	7,842	35	1,304		78
Deaths	11	1	2	—	—	4	—	4	—	1
Ophthalmia neonatorum	82	5	18		—	105	8	26		—
Deaths										
Pneumonia, influenzal*	1,161	49	11	2	5	644	34	4	15	8
Deaths (from influenza)	24	2	2	—	—	19	2	—	—	—
Pneumonia, primary			251	14				266	19	
Deaths		28		12	5		25		1	12
Polio-encephalitis, acute	—	—				—	—			
Deaths		—					—			
Poliomyelitis, acute	5	2	1		1	4	1	1	1	—
Deaths		—	—				—	—		
Puerperal fever	4	4	23	—	—	5	5	18	2	—
Deaths		—					—			
Puerperal pyrexia	128	9	17		2	157	12	16		—
Deaths										
Relapsing fever	—	—			—	—	—			—
Deaths										
Scarlet fever	1,114	66	149	54	17	1,079	57	137	62	96
Deaths	1	—	1	—	—	1	—	—	—	—
Small-pox	—	—	—	—	—	—	—	—	—	—
Deaths	—	—	—	—	—	—	—	—	—	—
Typhus	—	—	—	—	—	—	—	—	1	—
Deaths			—	—	—			—	—	—
Whooping-cough	4,121	130	440		8	633	6	63		17
Deaths	29	3	16	—	—	2	—	—	3	—
Deaths (0-1 year)	329	22	66	46	10	294	43	64	27	26
Infant mortality rate (per 1,000 live births)										
Deaths (excluding stillbirths)	4,613	604	654	195	119	4,364	733	604	204	166
Annual death rate per 1,000 persons living			14.2	12.9	10.4			12.2	13.6	14.6
Live births	5,110	386	935	441	206	7,443	1,130	1,023	401	294
Annual rate per 1,000 persons living			19.0	29.3	18.0			20.7	26.8	25.8
Stillbirths	186	16	36			249	28	40		
Rate per 1,000 total births (including stillborn)			37					38		

* Includes primary form in figures for England and Wales, London (administrative county), and Northern Ireland.

Medical News

The National Association of Maternity and Child Welfare Centres and the National Association of Probation Officers, London and Home Counties Branch, are holding a joint meeting on Monday next, June 30, at 2.30 p.m., in the Hall, at 117, Piccadilly, London, W.1, when Miss J. E. R. Kennedy, probation officer, Willesden Police Court, and Dr. Leslie Housden, chairman, Mothercraft Teaching Subcommittee, will speak on "The Bearing of Mothercraft Teaching on the Prevention of Juvenile Delinquency."

About a hundred doctors who saw service in hospitals, at aid posts, rest centres, and incidents during the raids on Clydeside met in Glasgow recently under the chairmanship of Sir A. S. M. Macgregor, medical officer of health for the city, to discuss and exchange experiences. Dr. James Dunlop, the chief A.R.P. medical officer, described the first-aid and ambulance services in action, and Dr. A. B. Walker, hospital officer, the reception and distribution of casualties, the calling out of reinforcements, and the emergency evacuation of hospitals. Prof. C. F. W. Illingworth discussed briefly the nature of the injuries, the treatment, the indications for morphine, and the work of a large hospital where the windows had been destroyed early in the raid. Other speakers were Prof. J. A. G. Burton, Mr. James Russell, Mr. G. H. Stevenson, Dr. Hunter (medical officer of health for Clydebank), and several doctors attached to first-aid posts. Among the points emphasized were the need for better protection for first-aid posts, and for shelters at posts to be heated and lighted artificially, and the value of senior medical students in the work of a casualty unit. Sir Alexander Macgregor said that the casualty scheme had worked well. Some re-allocation of doctors should be made to minimize the travelling distance to first-aid posts, and more doctors should be available to go to incidents. There had been many examples of great coolness and courage on the part of doctors and nurses.

The name of Dr. George Seymour Swan, surgeon, Birkenhead, has been brought to notice for brave conduct in civil defence.

The February issue of the *Journal of the Indian Medical Association* is a conference number devoted to the proceedings of the 17th All-Indian Medical Conference held at Vizagapatam from December 27 to 29, 1940.

Vitamin preparations containing added medicaments are subject to purchase tax unless the proportion of the medicament is so small that it has only a nutritional effect.

In the Soviet Union there are at present 117,000 doctors to about 200 million inhabitants.

Letters, Notes, and Answers

All communications in regard to editorial business should be addressed to THE EDITOR, BRITISH MEDICAL JOURNAL, B.M.A HOUSE, TAVISTOCK SQUARE, W.C.1.

Authors desiring REPRINTS of their articles must communicate with the Secretary, B.M.A. House, Tavistock Square, W.C.1, on receipt of proofs. Authors over-seas should indicate on MSS if reprints are required, as proofs are not sent abroad.

ADVERTISEMENTS should be addressed to the Advertisement Manager (hours 9 a.m. to 5 p.m.). Orders for copies of the *Journal* and subscriptions should be addressed to the Secretary.

TELEPHONE NO.—B.M.A. and *B.M.J.*: EUSTON 2111.

TELEGRAPHIC ADDRESSES: EDITOR, *Aitiology Westcent, London;* SECRETARY, *Medisecra Westcent, London.*

B.M.A. SCOTTISH OFFICE: 7, Drumsheugh Gardens, Edinburgh.

QUERIES AND ANSWERS

Urticaria

"H.S." (Carlisle) would be glad to have any suggestions for treating a stubborn case of urticaria in a woman of 24. She has been a sufferer for several years and all the usual remedies have been prescribed without any effect.

Post-herpetic Neuralgia

Dr. N. S. FINZI writes: With reference to the two recent inquiries about the treatment of post-herpetic neuralgia, I beg to inform you that treatment with very small doses of *x* rays to the posterior ganglia which are affected is a specific. The only case I have known to fail was one where the doses used were much too large and which was not treated by myself. I have had personal experience of the benefits of this treatment. The condition is made worse for a few hours and then steadily improves. If necessary the treatment is repeated at intervals of four to seven days.

Dr. BASIL KIERNANDER (Oxford) writes: With reference to "M.B., B.S.'s" query about the above (June 7, p. 876), it is always worth trying a course of low-intensity, local, short-wave therapy to the painful area daily for a few weeks, as about 50% of the patients definitely find relief from it, in my experience. There is no method of differentiating beforehand, so far as I know, between the cases which will and which will not respond to treatment.

Income Tax

Purchase and Sale of Practice on Accepting Service Appointment

"N.D." retired on pension from one of the Services in 1937 and bought a practice. In September, 1939, he sold the practice and accepted a Service appointment. Can he claim any relief?

** "N.D." is entitled to pay tax for 1937-8 to 1939-40 on the amount of his actual income; but he is not entitled to deduct any loss he may have incurred in taking over and giving up the practice, as such is a loss of capital.

Apparatus Prohibited from Use

"Diatherm" owns some high-frequency apparatus which he is prohibited from using under the recent Order. What income tax allowance can he claim?

** As regards depreciation, the income tax allowance is, strictly, applicable only to diminished value by reason of *wear and tear*, and unused apparatus does not qualify for the allowance. But we apprehend that a concession might be made in the special circumstances. As regards loss of income, if the total earnings fall by more than 20% as compared with the previous year, "Diatherm" can claim to be charged on the amount of the profits for the actual year. Apart from this special war-time provision, however, in the long run the loss of income will be allowed for in that "Diatherm" will presumably in the end pay tax only on the amount of his profits taking one year with another.

Liability on Service Pay

"Lieut." gives particulars of his pay and circumstances and asks how he stands as regards income tax.

** The amount of tax payable by him for 1941-2 is apparently about £58. It is not unlikely that monthly deductions in excess of the current sums are being made pending calculation of the actual amount due for the year. (Presumably our correspondent has made his return for the year claiming the appropriate allowances.)

LETTERS, NOTES, ETC.

Bee-sting Anaphylaxis

"D.S.O., M.D." writes: I doubt if anyone who has suffered from the effects of a bee sting in an acute form has ever described his symptoms, so I thought my experiences would interest some of my fellow members. On June 12, 1941, about 8 p.m., I was stung by a bee on the left ear. In a few moments I felt tingling in the head, neck, back, and the palms of the hands, and then all over the body. My eyes became "gritty" and the conjunctival vessels dilated. My face became very swollen. Next a marked urticarial rash developed all over my body and extremities. My lips were swollen and white; the rest of my face of a dusky blue colour. My pulse became fast and full and occasionally irregular, my breathing somewhat difficult. There were beads of perspiration on my forehead. This condition lasted for about half an hour. I was thirsty and drank about 1½ pints of soda water. Gradually the condition passed off, and in about two hours had practically subsided. I slept well during the night, but next day felt somewhat "washed out," but was able to do my work. Adrenaline was got ready, but as the condition was passing off was not used. I ought to add that in previous years I have had many bee stings, having kept bees for years, but never had a condition of anaphylaxis before. I am 69 years of age, and years ago had serum injections for prophylactic purposes on several occasions—antityphoid, antitetanic, etc.; also serum for diphtheria.

Messrs. E. and S. LIVINGSTONE inform us that the premises occupied by their binders have been destroyed by fire, with the whole of the contents, which included all work in progress and a large reserve of bound stock of their publications. They are doing everything in their power to replace the more important books and those in constant demand, but some of these will be out of print for some time to come, and medical men interested in their publications are meanwhile asked to make allowances.